COMMISSIONER OF PUBLIC HEALTH

WESTERN AUSTRALIA

REPORT

FOR THE YEAR 1959

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REPORT

OF THE

Commissioner of Public Health

for the year 1959

Presented to both Houses of Parliament

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The Honourable Emil Nulsen, M.L.A.,

MINISTER FOR HEALTH

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Sir,

I have the honour to submit the Report of the Department of Public Health for the Year 1959.

LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,
Commissioner of Public Health.

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DEPARTMENT OF PUBLIC HEALTH

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Report of the Commissioner

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TO THE HONOURABLE THE MINISTER FOR HEALTH

In the absence of Dr. Linley Henzell on long service leave, I have the honour to submit the report of the Department of Public Health for the year 1959.

During the year the population increased by 1·87 per cent. from 705,600 to 718,830.

In the following Vital Statistics (see Appendix I) the figures in brackets are the corresponding figures for the whole of Australia :—

Birth Rate—23·80 (22·56) per 1,000.

Death Rate—7·65 (8·90) per 1,000.

Natural Increase in Population, i.e., excess births over deaths—1·75 per cent. (1·37).

The maternal mortality fell to 0·29 per 1,000 live births, the lowest yet recorded in the State.

Infant Mortality Rate—20·16 (21·5) per 1,000.

It will be seen therefore that in all items we compare favourably with the rest of the Commonwealth.

STATE HEALTH COUNCIL

During the year the State Health Council met four times and of its sub-committees, the Hospital Requirements Committee met twice, the Maternal and Infant Health Committee met twice and the Mental Health Committee met once.

The following are some of the main subjects dealt with by the Council :—

Proposals for the redesigning of the procedure set out in the Health Act for the investigation of maternal deaths.

Notification of persons under treatment with narcotics and the appointment of an Advisory Drug Panel to advise on drug addiction.

Notification of Breast Abscesses, Eclampsia and Rheumatic Fever.

Endorsement of proposals for establishing branches of Public Health Laboratories outside the metropolitan area.

Recommendations regarding a new hospital in the Hollywood area.

Recommendations to the Cancer Council regarding the establishment of a clinic for the early detection of genital cancer in the female.

Appointment of a part-time lecturer for Infant Health Services.

Allocation of priorities for hospital construction.

We in the Department must once again record our indebtedness to the members of the State Health Council and its committees for their valuable advice and the many hours of their time given in an honorary capacity that are spent in discussion.

LOCAL AUTHORITIES

Rubbish Disposal

The Metropolitan Refuse Disposal Committee, which was formed in 1958, presented its plan to improve refuse disposal in the metropolitan area. The 27 local authorities within the area have formed six Zone Committees. The plan provides for one disposal site to be operated in each zone. It will now be an economic proposition for local authorities to employ heavy equipment and to adopt sanitary land-fill disposal methods, thereby reclaiming waste land for useful purposes and removing all chance of nuisance arising from rubbish disposal.

Fly Eradication Campaign

Metropolitan local authorities co-operated during the summer in a pilot Fly Eradication Campaign. From this considerable information was derived and encouragement obtained for permanent anti-fly measures.

LEGISLATION AMENDMENTS

The Health Act Amendment Act (Act No. 22 of 1959) empowered the Crown to enter into agreement with local authorities for the provision of apparatus for the bacteriolytic treatment of sewage and ablutionary facilities on Crown properties. Agreements so far concluded provide for the local authority to finance the installation with the Government repaying the cost over a period not exceeding fifteen years.

This has permitted an acceleration of the programme to abolish the conservancy system of nightsoil in schools.

The Nurses Registration Act was amended to enable the registration as Mental Nurses of persons who had qualified by examinations conducted by the Mental Health Services. All future registrations in this category will require that the applicant pass the examination of the Nurses Registration Board.

FOOD AND INSPECTORIAL STAFF

The Report of the Chief Health Inspector, Mr. C. E. Flower, is given in Appendix XVII.

Inspections covered a wide field of enquiry in addition to maintaining a general survey of the State. The number of animals examined by the meat inspection staff increased by 14 per cent.

A noteworthy item under Environmental Sanitation is the steady increase in the number of installations of septic tanks and the growing popularity of the combined tank which deals with both sewage and sullage water.

During 1959 seven more local authorities adopted by-laws making bacteriolytic treatment of sewage compulsory. New flushing systems such as the 6-pint and 2-pint method in place of the traditional 2-gallon flush now make it possible for practically all country towns to adopt bacteriolytic treatment methods.

In the metropolitan area pan services now are largely confined to builders' services. Even here, new approaches to the problem are being studied so that the need for pan services may be completely removed. During post-war years a laudable change in public feeling has taken place which rejects the sanitary pan as an antiquated, repugnant and unhygienic piece of near obscenity which must be replaced by modern sanitary equipment. This change of thought has been greatly assisted by the prohibitive and ever rising costs of pan services.

Food and Drugs

The Food and Drugs Advisory Committee met five times during the year and carried out a complete review of the Food and Drug Regulations.

Draft regulations prepared by the Food Standards Committee of the National Health and Medical Research Council governing Preservatives, Baking Compounds, Margarine, Tea, Coffee, Spices, Honey and Jams were adopted.

Pesticides

Two hundred and twenty-nine applications for the registration of products under the Pesticides Regulations were considered by the Pesticides Advisory Committee. The total number now registered is 935.

The Department is grateful to Dr. L. Samuel, Government Analyst, Mr. C. F. H. Jenkins, Government Entomologist, Mr. F. W. Avenell, Mr. M. G. Muggleton and Mr. W. A. Ashton for their assistance on these committees.

PUBLIC HEALTH LABORATORIES

Dr. William Laurie took up appointment as Director of Public Health Laboratories on 5th January, 1959. His report is given in Appendix II.

The Laboratory today is playing an ever increasing part in modern medicine. An adequate system of diagnosis and treatment cannot be maintained in a community without the assistance of an adequate laboratory. Although it is often possible and desirable to refer material to a distant central laboratory for examination, it is also often a vital necessity to obtain an immediate report and laboratory facilities have to be provided as close at hand as is practicably possible. In consequence, the Public Health Laboratories have undertaken the responsibility of providing laboratory services in the larger country towns.

The Albany satellite laboratory was commenced late in 1959. The Bunbury laboratory was already functioning. Further satellite laboratories are planned for Northam, Derby and Narrogin.

The Public Health Laboratories therefore combine the function of hospital laboratories for the Chest Hospital and country hospitals and a public health laboratory for the Department. This leads to a diversity and ever-growing amount of laboratory work.

Dr. Laurie's report indicates the amount and distribution of this work.

Food-poisoning

It is becoming increasingly evident that many varieties of salmonellae and other food-poisoning organisms are widespread throughout the State and many unsuspected carriers exist. These organisms account for many cases of mild to severe diarrhoea which occasionally may be fatal. Control of this is difficult and eradication impossible. They can be dealt with only by adopting and enforcing high standards of sanitation and hygiene particularly where food handling is concerned. The increasing frequency with which these organisms are isolated from material sent to our laboratories suggests that food-poisoning outbreaks may be on the increase in Western Australia and that every effort must be made to increase the knowledge of the people and their awareness to the dangers of improper and unhygienic methods of food-handling.

Tuberculosis

Dr. Laurie draws attention to the work of Dr. Kovacs on the atypical mycobacterium and the increasing frequency of its appearance in tuberculosis patients.

Water Sampling

An increasing amount of work is being put upon the laboratory from increased supervision and testing of country water supplies. Greater population densities in the vicinity of catchment areas have required this increased supervision and led to additional sampling. The end result of this has often been the installation of chlorination plant to produce satisfactory bacteria counts in samples.

A considerable strain was placed on the laboratory during 1959 in testing ocean samples in the vicinity of the sewer outfall and checking the results of chlorination and determining standards for such chlorination.

Virology

The Virus Section under the professional direction of Professor N. F. Stanley isolated for the first time in Australia the virus of trachoma.

The virus laboratory was also heavily involved during an influenza epidemic during March-June and isolated the virus of A/Asian influenza from several cases.

These and other matters are extensively dealt with by Dr. Laurie in his report.

TUBERCULOSIS CONTROL BRANCH

In his report, Appendix III, the Director of Tuberculosis Control, Dr. Alan King, indicates that the death rate for tuberculosis remains at the low figure of 3·3 per 100,000. In 1950 this figure was 22·9 per 100,000. This tremendous improvement in such a short space of time reflects the efficiency of new methods of treatment and the efficacy of preventive medicine. Tuberculosis is now relatively insignificant as a killing disease. During the year the number of persons with pulmonary tuberculosis on the case register dropped from 2,726 to 2,684. Of these 2,684, no less than 989 are known to have been born outside Australia. Of the 320 notifications of pulmonary tuberculosis during the year, 116 were from migrants. The rate of notification of pulmonary tuberculosis has now fallen to one notification per year for each 2,275 persons. However, as Mass Radiography shows that approximately one person per 1,000 has potentially infectious disease, it cannot yet be said that tuberculosis is no longer a public health problem.

New problems of atypical mycobacteria and typical mycobacteria resistant to the present known drugs used against tuberculosis show that we cannot yet be complacent in regard to tuberculosis and that considerable further effort must be expended to reach the goal of eradication.

In this regard a disquieting note is struck by Dr. J. McNulty in his review of miners in the Goldfields and at Wittenoom Gorge. (*See* Appendix VIII.) He gives the annual incidence of pulmonary tuberculosis among miners as 2 per 1,000 as compared to the above figure of 1 in 2,275 for the whole population. One worker in every thirty who entered the industry developed silicosis and there is little indication of any significant change for the better in recent figures. In the relatively new industry at Wittenoom Gorge, the figures also indicate the presence of considerable hazard from asbestosis, silicosis and probably tuberculosis.

When we recall also, the fact that the greatest incidence of lead poisoning which has occurred in our industry in recent years has been in lead mines, it is clear that a more active policy is required of the Health Department for preventing disease in mine-workers than the one it is at present legislatively relegated to. In other words, preventive medicine cannot effectively be carried out where only diagnostic examination is the responsibility of the Health Department and prevention is entirely the prerogative of engineers.

The Chest Hospital is now in full operation as a tuberculosis hospital with a number of beds set aside by agreement with the Commonwealth Government for the investigation and treatment of non-tuberculous respiratory disease.

Dr. Heymanson gives a report on the new Pulmonary Function Laboratory and the part it will play in diagnosis and assessment of respiratory function. (*See* Appendix VII.)

COMMUNICABLE DISEASES

The report of the Director of Epidemiology, Dr. Snow, is contained in Appendix X. A widespread epidemic of respiratory disease (probably due to Asian A influenza virus) occasioned considerable inconvenience and caused a large number of deaths, especially in old people. Unfortunately, effective preventive measures against this type of infection are not yet available and vaccines hitherto used against influenza appear to be only of partial value. A special study in connection with the epidemic suggested that fully vaccinated persons suffered a 23 per cent. infection rate as compared to a 35 per cent. infection rate in the non-vaccinated.

Poliomyelitis immunisation continued as a major activity throughout the year and the vaccination of adults was extended as far as possible. Every effort was made to make it easy for adults to obtain their injections, and clinics were held during the evenings and at localities especially convenient for housewives during the daytime. During the year, 309,914 doses of Salk vaccine were administered, mainly through the Department's four mobile units. Five cases of poliomyelitis occurred during the year, and these included the first example of a child who developed the disease despite three injections of Salk vaccine, although her symptoms developed so soon after the third injection that the child must have been incubating the disease at the time. The general indications are that Salk vaccination has resulted in the virtual disappearance of poliomyelitis, but it is essential that a maximum level of immunisation should be maintained.

Dr. Snow was absent from the State during the greater part of the year on an Overseas Study Tour, and returned with a number of recommendations concerning various aspects of public health. Some of these have already been implemented and others are being developed.

VENEREAL DISEASES

Dr. Debney's report, Appendix XI, indicates a further decrease in notifications.

It would seem that, so far, this State is not participating in the increase in venereal disease at present experienced in other States and in the United Kingdom and the United States of America.

It is possible that our relatively lower incidence of juvenile delinquency is to a large extent responsible for this, but it is not at all certain that notification is being adequately maintained.

INFANT HEALTH SERVICE

The report of the Medical Supervisor of Infant Health, Dr. E. M. Gibson, appears in Appendix XXII.

Seventy-three per cent. of all babies born in the State attended an Infant Health Clinic.

Two thousand four hundred and ninety-seven pre-school children also attended pre-school clinics and there are now three full-time nursing sisters looking after the pre-school child.

The opening of Ngal-a has facilitated the training of Infant Health Sisters which can now be done in this State.

New additions are being made to the headquarters building in Hay Street and, meanwhile, temporary quarters in Ord Street are being used to accommodate the expanded staff and functions of the Centre.

SCHOOL MEDICAL SERVICE

Many country schools are now up to date on a two-year schedule and all have been examined within three years.

A large part of the metropolitan area has been brought into the new plan of examination at the 6, 9 and 12 year age groups but extra medical assistance will have to be brought in temporarily to get this on a permanent footing throughout the metropolitan area.

School Medical Officers report that the general health and state of nutrition of the children remains good, but isolated foci of infection with head lice remain, particularly in country areas with native populations. (*See* Appendix XV.)

SCHOOL DENTAL SERVICE

The staffing position was fairly constant during this year and the Service was able to cover quite a lot of ground (*see* Appendix XVI). However, it is known that there will be at least four retirements early in 1960 without foreseeable hope of replacements.

From 1961 onwards some relief will be obtained from the Bursary Scheme which was begun in 1956, and it is to be hoped that this idea will be continued beyond the original scope of five years, since it is likely to be the sole source of recruits in the future, not only for the School Dental Service but also for the Perth Dental Hospital and its outstations.

During 1959, 179 schools were visited and 12,595 children examined, of whom 7,079 were treated.

NURSING BRANCH

In Appendix XVIII, Miss Lee, Principal Matron, reports that there is now a greater availability of trained nurses resulting in a better nursing service in Board and Departmental hospitals and with the increased number of trained nursing aides, a better standard of nursing is noticed, particularly in those hospitals which have been made Nursing Aide Training Schools and which formerly were staffed mainly by nursing assistants. There remains the problem of hospitals in areas which, by reason of climate and isolation, are not popular with staff. This, however, does not now apply to the North-West hospitals, particularly those in the coastal areas where positions are now sought after.

The Nursing Bursary Scheme, which commenced in 1955, will, early next year, provide some staff nurses for country General and Nursing Aide Training Schools, as a number of those who were selected in 1955 will complete their training by sitting for the State Final Examination in February, 1960.

PHOTOGRAPHIC SECTION

The report of the Senior Medical Photographer, Mr. Plummer, is contained in Appendix XXI.

This Section has continued to give a service of high standard in Medical Photography and Illustration to the Public Health Department, the Fremantle Hospital, the Princess Margaret Hospital, the King Edward Memorial Hospital for Women, and the Perth Chest Hospital.

Mr. Plummer has also provided a service to private practitioners and has rendered photographic assistance to the Pathology Department at St. John of God Hospital, Subiaco.

The work has been facilitated by the appointment of an additional photographer.

OCCUPATIONAL HEALTH

The report of Dr. Letham appears in Appendix XX.

Dr. Letham took over this branch of the Department's activities at the beginning of the year, as a full time responsibility.

He has got off to an energetic start and his preliminary investigations in Lead, Silica and Noise indicate the need for this type of medical supervision if the industrial worker is to be effectively protected from the many hazards associated with a wide variety of materials and methods used in industry.

Dr. Letham has been successful in making contacts in other Government Departments and in various industrial organizations and has obtained satisfactory co-operation in the reduction of industrial hazards.

It is obvious that a wide field must be covered in Occupational Health and that this will be an expanding branch of the Department's activities.

HOSPITAL PLANNING—METROPOLITAN AREA

Hospital planning was dealt with in detail in the 1950 and 1953 Reports. Appendix XXIII brings the position in the metropolitan area up to date.

The increase in general hospital beds since the 1950 report has kept pace with the growth of the population. The large deficit in chronic beds in 1950 has been eliminated largely due to the impact of the National Health Scheme, the rapid increase in " C " class hospitals and big additions to the class of hospital accommodation provided by such institutions as Mount Henry, Sunset, the Home of Peace and Wooroloo Hospital.

It would seem that with the present rate of growth of the population and with the present use made of hospitals, we will need a further 300 general beds within 6–7 years.

The planning and siting of a new metropolitan general hospital requires considerable thought and care. Consideration has not only to be given to population growth and distribution and to the teaching needs of the new Medical School, but also to factors difficult to assess, such as future variations in the National Health Act, changes in the population's earning capacity and alterations in medical treatments and techniques and, last but not least, changing conceptions of the hospital's function in the community.

HOSPITAL MORBIDITY AND MORTALITY STATISTICS

Tables are given in Appendix XXIV showing the combined statistics obtained from admissions to the three hospitals, Royal Perth, Princess Margaret and Fremantle, during 1958.

These figures represent roughly one-third of the State's use of general hospital beds.

It may be noted that 26 per cent. of the persons admitted were 60 years of age and over and that these persons occupied approximately 38 per cent. of the beds.

Nearly half the total beds (47·5 per cent.) were occupied by cases for operation and close on 20 per cent. (19·39 per cent.) of all beds were occupied by accident cases.

Accidental falls caused a surprisingly high intake of cases closely approximating in numbers and in the number of beds occupied the intake from motor vehicle accidents.

The tables give the admissions in groups according to the code of the International Classification of Disease. The average length of stay for each disease and the result are also given.

The regular maintenance of such morbidity statistics is of great assistance in the planning of hospitals and in ascertaining any variation in the function of hospitals as between hospital and hospital or in the same hospital during the passage of time.

RADIATION PROTECTION

The Radioactive Substances Act was assented to in December, 1954, and Regulations promulgated in December, 1958.

During 1959 the Radiological Advisory Council drew up rules for the granting of licences to persons other than medical practitioners for the use of irradiating apparatus and for licences to medical practitioners for the use of radioactive substances. A number of licences were subsequently granted.

LIBRARY

The report of the Librarian, Dr. Woolcott, is contained in Appendix XIV.

There has been a continued expansion in the volume of work and the services provided by the Library and, in spite of the handicap of inadequate accommodation, Dr. Woolcott and his assistant, Miss Woods,have coped with the situation with efficiency and provided a service both within and outside the Department which has been of invaluable assistance to many users and greatly appreciated by all.

CONCLUSION

During the year under review the work of the Department has continued along the lines of improving environmental sanitation, the prevention of disease and the education of the public in these matters. The Report indicates that satisfactory progress is being made in this direction and statistics show that we compare favourably with other States.

The hospital bed situation has improved considerably in recent years, particularly in the care of the aged and chronic sick.

Relations with other Government Departments, the medical profession and the general public have been good and co-operation sought has always been forthcoming and is gratefully acknowledged.

W. S. DAVIDSON, M.B., Ch.B., D.P.H.,
Acting Commissioner of Public Health.

Appendix I

VITAL STATISTICS FOR WESTERN AUSTRALIA

	1957	1958	1959
Mean Population—			
Males	355,518	361,951	368,254
Females	336,205	343,649	350,576
Total	691,723	705,600	718,830
Births—			
Males	8,738	8,532	8,726
Females	8,186	8,199	8,385
Total	16,924	16,731	17,111
Birth rate per 1,000 of Mean Population	24·47	23·71	23·80
Deaths—			
Males	3,126	3,270	3,240
Females	2,171	2,284	2,257
Total	5,297	5,554	5,497
Death rate—rate per 1,000 of Mean Population	7·66	7·87	7·65
Natural increase rate per 1,000 of Mean Population	16·81	15·84	16·15
Infant Mortality per 1,000—			
Live Births :			
Metropolitan Area	19·39	19·52	18·28
Rest of State	22·83	23·61	22·16
Whole State	21·09	21·52	20·16
Stillbirths :			
Metropolitan	117	107	102
Whole State	245	225	225

Comparison of Infant Mortality and General Death Rate

Place	Infant Mortality			General Death Rate		
	1957	1958	1959	1957	1958	1959
New Zealand (*a*)	19·98	19·40	19·89	9·29	8·90	9·09
Western Australia	21·09	21·52	20·16	7·66	7·87	7·65
New South Wales	22·70	21·29	22·65	9·20	8·76	9·38
Victoria	20·16	19·23	21·21	9·03	8·62	8·92
Queensland	21·68	19·40	20·25	8·39	8·10	8·59
Tasmania	20·15	19·49	23·42	8·09	8·02	8·07
South Australia	20·63	22·40	20·71	8·67	8·63	8·62

(*a*) Non-Maori.

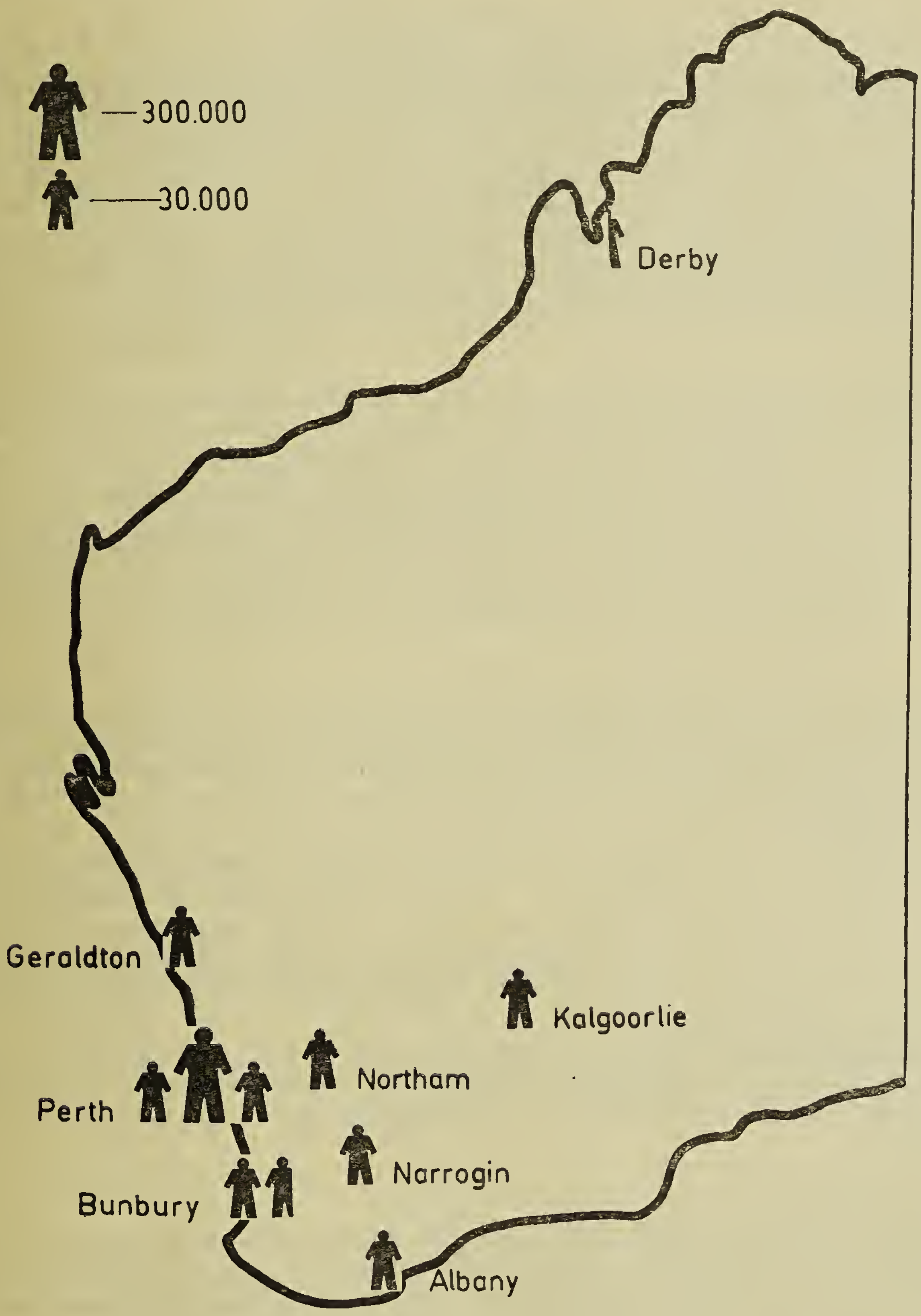
Appendix II

PUBLIC HEALTH LABORATORIES

To the Commissioner of Public Health, Western Australia

In this first report submitted by me to you it is necessary for the sake of clarity and convenience to recapitulate.

Western Australia covers a land area greater than Western Europe, with climates ranging from the temperate in the South-West to the truly tropical in the north, and ranging from seaboard conditions through forest country and tableland to central desert areas. The problem of health control is further complicated by the nature of the population-grouping, with half of the total population living in an area in and around Perth which is about that of greater London, leaving the other half of the population divided into groups scattered throughout the State. Fig. I illustrates the problem.



The physical difficulties shown above are further complicated by the diversity of the responsibilities of this laboratory service. Where the population and the available monies are sufficiently large it is customary to provide separate laboratory services, one to serve the patient and one to serve the community. This is well-shown in England where the laboratory needs of the individual patient are met by the hospital laboratory service under the control of the Regional Hospital Board, while the community as a whole is safeguarded by the Public Health Laboratory Service under the control of the Medical Research Council. This division of responsibilities is not wholly good and in any event it is not financially possible in our country of limited means. In other words this laboratory service must be responsible for the laboratory work concerned with the individual patient and with the community, at least over the greater part of the State. This is a highly satisfactory system provided neither interest suffers but until fairly recently the burden on the laboratory was too heavy in that the laboratory service included among its responsibilities the laboratory work of the large Royal Perth Hospital and in fact was sited in the hospital. By 1952 the situation had become critical so much so that my predecessor, the late Dr. W. A. Young wrote, " The year's work has been characterised by the constant increase in all branches of clinical laboratory work, the predicted congestion and overcrowding of the existing laboratories . . . and the curtailment rather than expansion of public health laboratory work owing to the intense pressure of urgent clinical pathology investigation in the Royal Perth Hospital. . . . The separation of the laboratory work of the Royal Perth Hospital from that of our other laboratory work has now become a matter of extreme urgency. This separation is essential both for the development of further laboratory services for the Royal Perth Hospital and for the complete re-orientation of public health laboratory services for Western Australia."

It is pleasant to be able to record that these warnings did not fall on deaf ears and it is greatly to the credit of all concerned that this report opens with the announcement that early in the beginning of the year under review (1959) the Royal Perth Hospital finally completed arrangements for the providing of its own laboratory services (except Tuberculosis and some serological examinations) leaving the State laboratory services greatly lightened and in a position to move to other quarters and to plan a more adequate hospital and public health laboratory service for the State as a whole.

1.—ADMINISTRATION

General

It has been pointed out that our responsibilities are twofold (a) to provide a satisfactory public health laboratory service, *i.e.*, " investigation of all epidemic and industrial diseases, the control of water supplies, sewage, river waters, and all problems of food hygiene and other related problems," (b) to provide a laboratory service for all individuals needing or seeking our help. This includes responsibility for the patient in all hospitals other than a few in the Metropolitan area of Perth. The duties were well summed up 15 years ago by the Nuffield Provincial Hospitals Trust when they said, " Every sick person, irrespective of his or her income, must be able to have pathology examinations made for the diagnosis and treatment of disease. This must apply to the sick in their homes as well as in hospital."

Satellite Laboratories

Both in regard to the capital expenditure on equipment and buildings and in regard to the recurrent expenditure on staff a large modern medical laboratory is a very expensive unit. To provide such a complete unit for each of our isolated population groups would be quite beyond our means even if it were considered necessary. This financial limitation must be balanced against the principle quoted above that all our people are equal in the eyes of the State and all legitimately may expect adequate health safeguards no matter how far removed they may be from the centre of government. The reconciling of these two opposing needs, *i.e.*, economy and necessary services, has been carried out by the introduction of satellite laboratories which are discussed under this heading later in the report.

Accommodation

With the shedding of the responsibilities for the laboratory work of the Royal Perth Hospital it was possible for the laboratory services to move to another site and this move was completed early in 1959. The new laboratories are sited in the new Perth Chest Hospital with the exception of the virology section still sited in the Perth Chest Clinic, and the animal breeding station which is sited in the grounds of the Infectious Diseases Hospital.

The new laboratories were well designed but as always happens the time lag between design and completion was such that the space allocated was insufficient before it even was occupied. At present the problem of space is not very pressing thanks very largely to the extra space loaned by the Superintendent of the Perth Chest Hospital and to the great help given by the Inspector General of Mental Health Services Western Australia. It is obvious however, that marked extension of our work will not be possible within the limits of the present accommodation.

In the planning of new laboratories the only satisfactory way of ensuring readily available space for continued expansion is by the wheel method of building, *i.e.*, a central administration building from which radiate individual departments like spokes in a wheel with new areas of work being added like new spokes as the need arises.

Equipment

The equipment for this new laboratory is adequate in quantity and of the finest quality. The only omission was that of sterile hoods for the handling of infectious material. One prototype hood has been installed and six more are on order. During the year the Public Works Department also installed a cold room and an incubator room in place of individual refrigerators and incubators.

Claremont Workshops

To enable us to provide a laboratory service to isolated country areas as well as hospitals it is essential that we hold large stocks of sterile syringes and other equipment necessary for the taking and satisfactory transportation of specimens. Our range includes over 20 different types of sets, *e.g.*, catheter sets, cerebrospinal puncture outfits, and the like. Between 3,000 and 5,000 individual items of this type are issued each month. In addition the routine work of the laboratory necessitates great quantities of sterile glassware and necessitates great quantities of media of different types. The tuberculosis section alone has over 12,000 bottles of media in use at any one time, with a monthly turnover of 5,000 to 6,000 bottles requiring cleaning, sterilising and re-filling. It is customary for this cleaning and sterilising of glassware, and the preparation of media, to be regarded as an integral part of the laboratory work. This part of the laboratory work is noisome, offensive and space-consuming and it is very doubtful whether any justification exists for the inclusion of such work in the laboratory area proper especially when the laboratory is occupying expensive space in a modern hospital. In collaboration with the Mental Health Services we have therefore launched a pilot scheme aimed at testing the feasibility of having all equipment preparation and media preparation carried out on an industrial training basis by the patients under the care of the Mental Health Services in the nearby Claremont Mental Hospital.

The first six months' experience of this experiment has shown it to be highly successful, so much so that it would probably be justifiable to build a special building, probably at Claremont, to house all this work. A few laboratory personnel would be required to oversee the technical side of the production.

Tours

During the year the Director carried out routine visits to sites for satellite laboratories.

Mr. Drummond, Chief Technologist, attended a three-weeks' Civil Defence School at Mount Macedon, Victoria, and spent three days visiting the Commonwealth Serum Laboratories, Public Health Laboratories, Melbourne, and Footscray District Hospital.

Handbook

With the introduction of more complex methods of investigation especially in biochemistry, the types of transport containers are increasing, consequently it is commonplace for specimens to be sent in the wrong container. To reduce this a handbook has been prepared and will shortly be issued for the guidance of the individual medical practitioner.

2.—STAFF

1. *General*

It is still true, as it was 10 years ago, that " slowness in the recruitment of staff has become one of the major hindrances to progress." Due to the expansion of laboratories elsewhere and the opening of new laboratories qualified technologists are in short supply and consequently there is much temptation for staff to move from laboratory to laboratory.

During the year the resignations were—Senior Technologists 1, nil ; Laboratory Attendants (animal house) 1 ; Clerical 1.

Transfers were—Laboratory attendants, 12.

Promotions were—Technologist to Senior Technologist, 1.

Recruitments were—Technologists, 2 ; Trainees, 7 ; Laboratory Assistant, 1 ; Attendants (animal house), 2 ; Clerical, 2.

It is with deep regret that we report the death during the year of Mr. Gannaway, a senior and a very experienced Laboratory Assistant.

The above changes do not reflect the posts created in 1959 but still not filled.

Due to shortage of suitable local applicants it has been necessary repeatedly to advertise overseas. It is hoped that this will cease as increasing numbers of trainees become qualified. The present scheme of training laid down by the Western Australian Branch of the Institute of Medical Laboratory Technology is very good indeed but makes heavy demands on the trainees, consequently there is much unavoidable wastage. Partly on the grounds of staff shortages and partly on the grounds of economy use is being made of laboratory attendants for routine repetitive laboratory examinations of a simple kind not requiring much skill or prolonged training.

2. *Classification of Laboratory Staff*

In this service the classification of laboratory workers is—

(a) Technologist	An individual who has completed the prescribed five years' course of training and who is qualified to work in any section of the medical laboratory. Alternatively the technologist may be a graduate with special training in one branch of laboratory work.
(b) Technician	An individual who has not completed the prescribed course of training but who by virtue of years of training has become experienced enough in one branch of laboratory work as to be given rank within that section of the laboratory.
(c) Laboratory Assistant	A trainee technologist with adequate initial educational qualifications, who is attending the prescribed course of teaching, and who is employed under supervision in one section of the laboratory after another.
(d) Laboratory Attendant	No educational qualifications and no prescribed course of training. Recruited for the carrying out of the humdrum cleaning and sterilising duties. Certain of these may be employed on some of the more routine repetitive types of laboratory procedures.

3. *Health of the Staff*

With a few exceptions the staff show a satisfactory record of health.

4. *Pathologists*

The ratio of pathologists to technical staff still remains at the highly unsatisfactory figure of 1 to 10.

3.—WORK DONE IN 1959

1. *General*

One of the greatest difficulties in assessing work done is to find a satisfactory method of presentation and analysis. Medical laboratory tests vary greatly in their complexity one from another and there is no uniformity in methods of counting tests, e.g., one laboratory may quote a complete antibiotic sensitivity test plate as one test whereas another laboratory would count each disc as a separate test. There is little point therefore in simply cataloguing " number of tests done." To obtain a more realistic idea of work done and of the costs involved we introduced in 1959 the method of costing, originally used successfully in England for over 20 years and latterly introduced into the New World. This method is the system of " unit values " in which each test is given a relative arbitrary value compared with a value of one unit for the simplest tests, e.g., the test for albuminuria is valued as one unit compared with a value of 20 units for the estimation of a basal metabolic rate.

Since the system of unit valuation of work was introduced into this Department only in March, 1959, we have still reported the 1959 work in terms of tests done. The new system will be introduced in the 1960 report.

The move of the central laboratory of the Health Services from the Royal Perth Hospital to the Perth Chest Hospital meant a return of the laboratory services to the original role of a complete service for hospitals and the community, i.e., a return to a service again possessing departments of bacteriology (and tuberculosis), serology, pathology, biochemistry, and haematology. It was to be expected therefore that there would result a significant rise both in the range of work done and in the amount of work done, not only because of the reintroduction of certain departments but also because it again became possible adequately to investigate certain disturbing new developments in the problem of tuberculosis.

The return of the tuberculosis section to the general laboratories freed a small complete laboratory unit at the Perth Chest Clinic and thus allowed of the bringing into being of a new section of this laboratory service, namely the virology section. This separation is a regrettable necessity which it is hoped will be only of short duration. One possibility is that the virus section may in the future be accommodated in the space to be made available in the central laboratory by the transfer of non-laboratory work to the Claremont sheltered workshops.

Appendix Table I summarises the tests done during the year. As was expected the 1959 tests show a marked rise in number over previous years totals, almost wholly due to the re-opening of departments such as haematology, even although such departments have not functioned for the full year. Tables 2–8 analyse in detail the work of each section. It should again be stressed that, in that much of the increase in numbers is in tests of some complexity, the increase in work is greater than is indicated by the rise in the number of tests.

Some notes are given below on the more important facets of each section's work in 1959. The work is only discussed in brief outline. It is proposed to publish individual papers on each finding thought to be of enough importance to justify this.

In these brief notes it is difficult and confusing to separate the public health laboratory work from work carried out for individual patients, and indeed often such separation is neither possible nor desirable, e.g., in diphtheria, or salmonella infection, or in the problem of the hospital staphylococcus. Accordingly the following brief notes are culled indifferently from either section of the laboratory work.

2. *Bacteriology—General*

The work of this section is summarised in Table II in the Appendix.

Problems worth special mention include the following.

(a) *Diphtheria.*—In all, material from 41 patients yielded organisms identified as *C. diphtheriae,* but only 13 of the 41 strains proved to be virulent, leaving a surprising balance of 28 strains non-virulent. Sixteen of these 28 avirulent strains had been picked off from routine swabs carried out on new admissions to the neighbouring children's hospital.

Eleven of the 13 virulent strains were " mitis " type, the other two being " gravis."

As was reported in previous years no one medium could be relied upon to give 100 per cent. recoveries ; accordingly the system was continued of using Loeffler's slopes + Tellurite plates + modified Schroer enrichment medium. Any cutting-down of this method would be extremely ill-advised in view of the recently confirmed finding that diphtheria can infect and even kill in " satisfactorily " immunized population.

(b) *Bowel Infections.*—Although there is an increasing awareness of the seriousness of the problem it is highly probable that the numbers of Shigella and Salmonella infections identified in this laboratory represent only a small proportion of the cases actually occurring. Many patients suffering from diarrhoeal disorders presume that they have an attack of " food poisoning " or " virus diarrhoea " and do not seek adequate investigation.

In 1959 the laboratory diagnosed 51 cases of dysentery, Sh. sonnei 10, Sh. flexneri, var. 41. One outbreak due to Sh. flexneri III, which occurred in a school, showed the necessity for carrying out sensitivity tests on Shigellae. The particular strain responsible for that school outbreak was found on testing to be resistant to all the sulpha drugs and to require the administration of the antiobitics to control infection.

The Salmonellae provide an even more difficult problem than do the Shigellae in that in many cases the patient may suffer only mild discomfort. The position as regards salmonellosis in Western Australia is summed up in the World Health Organisation's Bulletin on Diarrhoea (vol. 21, No. 3), namely, " The information available about salmonellosis, a controllable disease with a wide distribution, is unsatisfactory for many reasons . . . . No country in the world can be said to possess now either a reasonable picture of the occurrence of this disease within its borders or an organisation which has brought it under control."

Patients suffering from salmonellosis show a spectrum of effects ranging from the almost symptomless carrier———→gastro-enteritis type of disease———→frank " enteric fever " type of involvement. Generally speaking, individual members of the Salmonellae produce effects upon the patient which follow a characteristic pattern, i.e., one of the types of attack listed above, e.g., ranging from the symptomless infection with S. pullorum to the grave disease produced by S. typhi. On occasion, however, a near-saprophyte may produce frank disease in a patient. Also, while it is generally thought that the chronic carrier state is a very unusual finding following salmonellosis, it is possible that this carrier state occurs more commonly than was thought, e.g., the Ministry of Health Bulletin for January, 1960, reports an individual known to have harboured S. bovis-morbificans for six years.

During 1959 the number of proved Salmonella infections identified in this laboratory numbered 37, divided into S. typhi 7, S. typhi-murium 22, others 8. In one of the S. typhi patients the source of infection, a chronic carrier, was detected by screening with Vi antigen.

In this area the Salmonellae threatened not only the individual but also the community economy by the threat to the egg-pulp industry and the prepared foods industry. Accordingly individuals have been recruited and laboratory space has been made available for the work of a Salmonella Investigation Unit, the function of which will be to investigate the problems of salmonellosis in this State.

One striking example of how Salmonella spreads was the appearance this year in egg-pulp of a Salmonella first identified two years ago as a new strain, S. fremantle, found in an aboriginal suffering from gastro-enteritis.

It is certain that the easiest aspect of the work on salmonellosis in this State will be the laboratory investigations. Control of the disease will prove to be extremely difficult, especially as regards safeguarding of foodstuffs and the cleaning-up of fly breeding.

(c) *Sewage Testing.*—In our 1958 Annual Report details were given of an " outbreak " of typhoid fever connected with sewage-fouling of a metropolitan beach. The conclusions reached in that Annual Report are in no way invalidated by the recent English Medical Research Council's Report on the possibility of infection from polluted bathing beaches. Any consideration of the seeming discrepancies in the two reports must take into account the great differences which exist between the two countries, e.g., temperature of the sea water, number of individuals who do bathe, and the number of times they are exposed to risk, etc. It is difficult to believe that anyone of his own free will would bathe in the arctic waters of an English summer !

During the year 1959 the laboratory continued its frequent regular routine testing for fouling of the metropolitan beaches and found the same pattern as previously, namely, highly satisfactory M.P.N. coliform counts as the common finding but with an irregular occurrence of very heavy fouling of certain beaches. Investigations into these findings would suggest that two factors operate to produce this picture of infrequent irregular fouling, namely, (1) the routine chlorination of the sewage is sufficient to produce a fairly satisfactory effluent under the ordinary operating conditions but is insufficient to copo with an occasional peak load, (2) even this occasional break-through of an unsatisfactory sewage effluent usually is controlled by the dilution factor operating when the effluent finally is discharged into the tidal waters but this second factor also fails at those times when the current is setting hard to the north and there is a strong onshore wind.

Work is now in progress to extend the sewage discharge pipe into deeper water and one interesting possibility is that this greatly increased dilution factor may obviate the need for costly routine chlorination of the effluent.

(d) *Water Testing.*—As with sewage testing the great difficulty in the testing of water is to find a method of analysis which is quick, reliable, and cheap. The presently-used system of testing for coliforms and " faecal " coli has serious disadvantages, *viz.*, the method is time-consuming, locking the stable door after the horse has been stolen ; it is expensive in man-hours and materials ; it tests only relatively small samples. The results obtained (M.P.N.) are only an approximation. Waters may be free from coli and yet be heavily infected with pathogens as with fouling from pigs. And finally the presence of coliforms in water is not a certain indication of recent fouling.

With the above in mind experiments are continuing to test the possibility of using the enterococcus as an indication of fouling, with membrane filters as the method. This would allow of quick, cheap testing of large samples of water and would yield an exact figure instead of approximation. To date our findings are encouraging, but there can be no scrapping of the old tried methods until standards have been evolved for the new methods.

The question of water purity raises the thorny problem of water supplies for country areas. In many parts of the world two standards of purity are conceded, one for the large urban centres and one for the country. Since the countryman is just as susceptible to infection as is the townsman this lowering of standards would seem to be illogical and the solution probably lies not in condoning lower standards but in searching for methods of producing potable water in small quantities. In this connection a recent experiment in this department may have some application. Aimed originally at producing sterile water for use in operating theatres, the laboratory evolved a simple method of cleaning and sterilising water by the combined use of a filter-candle and ultra-violet irradiation. This has proved practicable and could well be adopted to produce pure drinking water.

(e) *Hospital Infection.*—Although the haemolytic Streptococcus is again beginning to rear its ugly head it is still true that " hospital infection " in fact means infection by the Staphylococcus which, to quote The Lancet, " turned so many hospitals into plague houses." Even in the new modern Perth Chest Hospital with its very high standards Staphylococcus is beginning to produce disease. It is especially serious when this offending organism succeeds in implanting itself into diseased lung tissue with resultant pneumonia which is difficult to control. One such case of this type was of particular interest in that the Staphylococcus found in the patient's sputum washings changed its sensitivity from time to time. The impression was that changes were occurring such as those quoted by Rountree and by Asheshov (J. General Microbiol, June, 1959).

As part of attempts to control the hospital Staphylococcus, and also to prevent any cross-infection with tuberculosis, work continued through the year on problems such as air pollution, sterility of air conditioning, etc. Air sampling was carried out frequently, both with slit samplers and by exposing laboratory animals. Work also included the testing of different types of face masks, testing of new types of pads for vacuum cleaners, and methods of sterilising hands. This last investigation yielded much information worth separate publication but it should be noted that simple inexpensive methods of hand cleansing proved much more effective than did highly expensive proprietary preparations. Another finding of much interest in this connection is that the hands of the male members of the staff were sterilised much more readily than the hands of the female members of the staff and one likely explanation is that the female members were making frequent use of hand creams and beauty creams which probably protected the organisms by a film of grease which only was removed with difficulty.

3. *Tuberculosis*

In table III, a summary is given of the work done in the tuberculosis section during the year 1959.

The great majority of cases of human tuberculosis become infected from other individuals excreting the causitive organism. In view of the high cost to the nation of every case of tuberculosis, it is essential exhaustively to investigate any individual even remotely suspect of excreting the tubercle bacillus. This has become a most important duty of the laboratory in view of the recent marked increase in the number of phthisis patients now receiving domiciliary treatment after the sputum seemingly has become non-infectious. Unfortunately as regards growth characteristics the tubercle bacillus is shy and retiring and, while we have recently tested new media of much promise, our present methods of investigation are those used in tuberculosis laboratories everywhere, namely, as in diphtheria, a screen of growth media of different types, supplemented by animal inoculation. Such a method is well described as " very laborious, very time-consuming, very expensive, and very, very necessary."

During the year 1959, 7,235 specimens were examined for mycobacteria and the findings were

Total Number of Specimens	Positive Findings					
	Total		Showing Myco. Tuberculosis		" Atypical " Mycobacteria	
	No.	%	No.	%	No.	%
7,235	910	12·5	727	10	183	2·5

The 910 positive specimens originated from 249 patients. In 60 (*i.e.*, 24 per cent.) the disease was due to the " atypical " mycobacterium, and three patients showed both types of mycobacteria.

The comparative value of the three media used is shown by the analysis below. To summarise :—

(1) All three media showed growth with 43 per cent. of specimens (this is a marked improvement on the 1958 figures).

(2) Kirchner medium *alone* succeeded with 10 per cent. and *alone* failed with 15·3 per cent.

(3) Loewenstein-Jensen medium *alone* succeeded with 5 per cent. and *alone* failed with 24 per cent.

(4) Blood medium *alone* succeeded with 7 per cent. and *alone* failed with 7 per cent.

Probably the significant improvement in recovery rates is due to a lessening in the severity of the initial processing of the samples, *e.g.*, water-bath immersion has been omitted; it is possible that by the processing previously used, in our anxiety to kill secondary organisms we probably also completely sterilised sputa, etc., containing small numbers of tubercle bacilli. That this improved recovery rate is not being bought at the price of a high increase in secondary contamination especially in the blood medium is shown by the fact that the contamination rate in blood medium in 1959 is 8·8 per cent. compared with the contamination rate of 6·5 per cent. for 1958. The different contamination rates for 1959 are tabulated below.

	Total No. of Tubes Inoculated	Negative		Positive		Atypical Mycobacteria		Contaminated	
		No.	%	No.	%	No.	%	No.	%
Loewenstein-Jensen	14,470	12,846	88·7	645	4·5	212	1·5	767	5·3
Blood	14,470	12,647	87·4	904	6·2	229	1·6	690	4·8
Kirschner	13,537	11,069	81·7	1,010	7·5	266	2·0	1,192	8·8
Total	42,477	36,562	86·1	2,559	6·0	707	1·7	2,649	6·2

From the above it will be seen that the results on the different media show much less marked differences than has been the case in previous years but it is still true to say that as yet no one medium can be relied upon to the exclusion of the other two even though this use of three media is extemely expensive.

Much the most striking finding in the 1959 work of the tuberculosis section has been the emergence of the " atypical " Mycobacterium from a position of relative unimportance to being a common cause of " phthisis." In 1958 this organism was reported as responsible for 11 per cent. of cases found but in 1959 the " atypical " bacillus was found to be the causative organism in 41 per cent. of the patients, and already in 1960 (February) the percentage is even higher.

STATISTICAL ANALYSIS ON 902 POSITIVE CULTURES (721 M. TUBERCULOSIS = 80% + 181 ATYPICAL = 20%) COMPARING GROWTH ON DIFFERENT MEDIA USED IN 1959

Note.—L-Jensen = Loewenstein-Jensen

			L-Jensen or Blood Medium Positive and Kirchner Medium Positive				L-Jensen and/or Blood Medium Positive and Kirchner Medium Negative							
	L-Jensen Blood Kirchner	Positive Positive Positive	Kirchner L-Jensen Blood	Positive Positive Negative	Kirchner L-Jensen Blood	Positive Negative Positive	Kirchner L-Jensen Blood	Negative Positive Positive	Kirchner L-Jensen Blood	Negative Positive Negative	Kirchner L-Jensen Blood	Negative Negative Positive	Kirchner Blood L-Jensen	Positive Negative Negative
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
M. tuberculosis	295	32·7	55	6·1	183	20·3	31	3·4	26	2·9	51	5·7	80	8·9
Atypical	92	10·2	14	1·6	32	3·5	4	0·4	18	2·0	8	0·9	13	1·4
Total	387	42·9	69	7·7	215	23·8	35	3·8	44	4·9	59	6·6	93	10·3

Thanks to the co-operation of the clinical staff of the Perth Chest Hospital there has been launched a comprehensive clinical-laboratory investigation into the problems of and the significance of the " atypical " Mycobacterium. Roughly speaking at present the position would appear to be.

(1) Clinically and radiologically the lung disease produced by this organism cannot be distinguished from the classic phthisis due to the Mycobacterium tuberculosis.

(2) In our experience, a microscopic picture identical with classic phthisis has been found in lung tissue removed at autopsy or operation on patients suffering from lung disease due to the atypical organism. It should here be said that in all such cases tested to date by us it was always possible to grow the atypical organism actually from the lesion in the diseased tissue recovered at autopsy or operation.

(3) So far, therefore, differentiation between the atypical Mycobacterium and Myco. tuberculosis is possible only in the laboratory. This is discussed more fully below.

The atypical organisms show colonial characteristics which usually differentiate them from the Myco. tuberculosis and which allow, as Runyon has done, of subdivision of this class into four groups. From the viewpoint of the laboratory the most striking characteristics of the " atypical " class of organism include non-pathogenicity to guinea-pigs, growth over a wide temperature rate (22° C. to 44° C.), changed enzyme reactions, and changed sensitivity to chemotherapeutic agents.

The incidence of this type of " phthisis " varies widely from country to country and even within Australia. It is probable that these differences are due to some extent to differences in laboratory techniques. In view of the great and increasing importance of this problem it is essential to form as quickly as possible a laboratory working committee within Australia.

Although at present there is no experimental justification for drawing conclusions, one tempting theory is that the emergence of the " atypical " Mycobacteria is a result of the widespread use in recent years of the newer anti-tuberculosis drugs, exactly analagous to the emergence of the hospital Staphylococcus. This theory would well fit with the high incidence of our findings in Western Australia which possesses a highly efficient Tuberculosis Control Service.

4. *Virology Section*

In the work of this section of the laboratory we are indebted to Professor Stanley of the University of Western Australia for much help.

This is a new and necessary section of the laboratory without which we would be unable adequately to function as a full laboratory service. A summary is given in Table IV of the work done in the virology section in this first year of its functioning.

As with other sections of the Central Laboratory the intention is that diagnostic and research investigations should both be carried out in the virology section, and the table of work done shows that this was possible even in the rather difficult conditions of this formative period. In addition to the routine investigation of possible virus infections time was found to carry out two major undertakings, one diagnostic and one a research project. The first major undertaking was the investigation of an epidemic of short-term fever which broke out in this State in the early months (Autumn) of 1959. This epidemic caused high morbidity with, later in the epidemic, a significant number of deaths partly among the elderly and the very young. The clinical picture suggested influenza and the virology laboratory succeeded in isolating the Asian strain of the influenza virus from six individuals from whom samples had been sent to the laboratory. That this indeed was an outbreak of Asian influenza was also supported by the serology section which tested large numbers of sera against several strains of the influenza virus.

The other major undertaking was a research project the results of which reflect much credit on the virus laboratory and on the Consultant Opthalmologist to the Western Australian Department of Public Health. Trachoma is an important public health problem in Western Australia and the success of Collier and his co-workers in growing the trachoma virus, using new techniques introduced by the Chinese workers, stimulated similar work in this State. A full report of this work has been submitted for publication by the workers concerned but in brief the laboratory was able to cultivate the trachoma virus for the first time in Australia and with the co-operation of Dr. Ida Mann, the Consultant Ophthalmologist, it was possible firstly to infect a volunteer and later again to grow the virus from the lesions produced in the inoculated eye. Thus it was possible to meet all Koch's postulates. The weapons thus provided by the virus section may result in improved methods of diagnosis and may assist in the control of the disease by the production of a vaccine. With these possibilities in mind an *ad hoc* Trachoma Research Unit has been formed and is now at work.

5. *Biochemistry*

Table VI gives a summary of the tests carried out in 1959.

As with the other sections which have been re-opened, the biochemistry part of the laboratory only began to function about mid-1959 and is not yet fully functioning. In biochemistry there is as yet no standardisation of methods used in individual laboratories, and not all the methods used are equally exact. Accordingly the first responsibility of the new biochemistry section was to test and draw up details of the more generally acceptable tests in use for the common investigations and to issue this handbook of testing to the branch laboratories. This project has now been completed. One other important duty which must continue henceforth is the making up of all standard solutions and stock solutions for use in branch laboratories. This semi-standardisation of methods and accurate standardisation of reagents assists towards the production of uniform dependable results through all the laboratories in the Service. This is reflected in the satisfactory results obtained on routine " unknown " specimens sent every week to all branch laboratories for examination and subsequent report to the central laboratory. In the small amount of work done during the year no particular problem of interest emerged.

6. *Haematology*

Table VII summarises the work of the haematology section in 1959.

As in the biochemistry section the haematology work did not fully begin until mid-1959 but by the end of the year the demands on the section were varied and substantial, and included the work of a small blood bank required by the Perth Chest Hospital.

In blood investigations probably the most common abnormal finding was that of mild iron deficiency of females ; also a number of severe anaemias of this type were seen in aborigines suffering from hookworm infestation. The megaloblastic anaemias seen were all from patients thought to be suffering from pernicious anaemia. In one patient the blood picture suggested the dimorphic type of anaemia so commonly seen in India.

Blood films from one patient showed a malarial infection which had been acquired outside Australia.

Already in this first few months of functioning of the haematology section one question which has presented itself and which will become increasingly a problem is that of adequate laboratory protection for patients receiving anticoagulant therapy. In the prolonged anticoagulant therapy which is being used increasingly in clinical medicine the patient requires fairly close laboratory investigation much in the same fashion as in the early days of treatment of diabetes by insulin. Already in England at least one large laboratory provides a house service for this anticoagulant testing. In this connection the greatest need at present is for a more satisfactory test than those at present in use which test only at the most two to three of the several factors entering into the complex process of blood coagulation.

7. *Serology*

The work of this section is summarised in Table V Appendix. The serology section is the only one of its kind serving the State, and therefore to an even greater degree than the other sections of the Laboratory it draws its material from all parts of the State especially since the satellite laboratories do not normally carry out this highly-specialised non-urgent class of work. Brief notes on the more important findings in 1959 are :—

(a) *Syphilis.*—Seems to be very definitely on the wane so much so that it is now difficult to obtain sufficient Wasserman-positive control serum for the needs of the Central Laboratory. Most of the material for this type of investigation comes from the Aboriginal population, especially in the North.

(b) *Leptospirosis.*—During the year four individuals were found serologically " positive " for leptospirosis. These patients were from the South-West of the State, the infection presumably being with L. pomona. One patient in contact with rats was diagnosed as suffering from leptospirosis icterohaemorrhagiae by his medical adviser but our serology department investigations have not confirmed this diagnosis so far.

(c) *Brucellosis.*—Brucellosis is endemic in the South-West of the State where much of the milk drunk is not pateurised. During 1959, 12 of the sera tested for brucellosis gave " positive " results and in all of the 12 cases this finding seemed to fit the clinical picture. It is probable that brucellosis is much more common than our findings would suggest.

(d) *Virus infections.*—Where possible all the serology of the virus infections is carried out in the serology section of the Central Laboratory. While a start has been made on the serology investigations of other virus infections the two infections to which most attention was paid in 1959 were influenza and trachoma. The influenza investigations began after the Asian influenza epidemic early in 1959 and they have continued through the year. Several surveys carried out on populations with accurate medical histories and inoculation histories have shown the influenza testing to give satisfactory answers.

The trachoma investigations are somewhat less satisfactory due to the lack as yet of an antigen prepared from trachoma material. The antigen used in the trachoma complement fixation test was ornithosis—L.G.V. antigen prepared by the Commonwealth Serum Laboratories. The marked antigenic overlap among the pathogens of this group, *i.e.*, psittacosis-ornithosis-trachoma-L.G.V. group, must be kept in mind in the assessing of " positive " results in trachoma investigations. Fortunately, although they do occur, psittacosis and ornithosis seem to be rare in Western Australia and are unlikely to be a serious complicating factor in trachoma surveys.

A laboratory test for infective hepatitis has been tried out now for some 18 months. It is the Morrison-Hoyt haemagglutination test. In addition we are trying also the technique of Rubin Kemp & Bennett. Throughout the year sera were requested from all clinicians notifying cases of this disease, and clinicians were asked to comment when the laboratory findings were not in agreement with the clinical diagnosis. So far the results are encouraging. Among the sera submitted from one metropolitan general hospital there were seven such individuals in whom the clinicial diagnosis was at variance with the laboratory findings and in whom it was possible to obtain further evidence either by liver biopsy or at autopsy. In all of the seven (two positive and five negative by laboratory standards) the laboratory findings were found to be correct.

(c) *Toad Tests.*—Early in 1959 several reports appeared, particularly in the American Medical Press, suggesting that individuals receiving tranquilizing drugs may exhibit false-positive pregnancy tests. This was investigated by the serology section which ran quite a large series of tests by the Bufo marinus technique on urine from 100 non-pregnant individuals under medical care in the Metropolitan mental health hospitals and receiving large doses of phenothiazine. (400-800 milligrams of Largactil daily.)

In no instance did we find any urine to produce spermaturia in the toads. In addition as a further protection all clinicians were invited to send blood samples from all patients receiving tranquilizing drugs and whose urine had shown positive pregnancy findings. In the small number who took advantage of this no discrepancy was revealed.

(f) *Medico-legal Work.*—During the year 1959 the serology section was concerned with 10 cases of death by violence, three cases of woundings, and 16 sex offences. Because of its character much of this work had to be carried out in the evenings, and the work also entailed some travelling to country centres to present findings.

8. *Pathology*

The small amount of work done is summarised in Table VI in the appendix. This laboratory service provided the first pathology facilities to Western Australia and under the care of Dr. T. R. Lubbe the work was of so high a standard as readily to gain the confidence of the practitioners of the State. It is a matter of disappointment therefore that until now it has been possible only to re-establish limited work in this section. The great part of the work is at present being carried out by the Royal Perth Hospital to which we are much indebted for this privilege. Steps are being taken to fill this gap in the service.

As explained above, little could be done in this field in 1959. The work was limited mainly to exfoliative cytology material. The autopsies carried out numbered only seven.

One autopsy and the previous haematology investigations showed death to have been due to aplastic anaemia developing in relation to Streptomycin treatment of phthisis.

9. *Parasitology*

There is little at present to write in this section as the specimens examined amounted to only a few submitted during a small survey among the Aborigines. The one case of malaria already mentioned undoubtedly had been acquired outside Australia but it is known that mosquito vectors do exist in the State and that a reservoir of infected blood must occasionally be present in transients therefore with the tropical climatic conditions of the North malaria should always be considered as a possible diagnosis in individuals suffering from fever of unknown aetiology.

Hookworm disease is common among the Aborigines, the infestation often being heavy enough to cause severe anaemia. This is likely to be found also in the white population. Another condition rarely reported previously but one which also has recently been found among the Aborigines is amoebiasis. It is hoped that with the opening of a satellite laboratory in the North of the State it will be possible to get a more exact picture of disease incidences than exists at present.

Trachoma is another disease which can and indeed has been found to spread from the Aborigine to white people.

4.—SATELLITE LABORATORIES

To the clinician there are certain laboratory investigations in which speed is almost as important as accuracy, *e.g.*, serum electrolyte levels, prothrombin estimations (markedly affected by transport), blood sugar levels, blood grouping and cross-matching, the sensitivity pattern of organisms, etc., etc. Satellite laboratories therefore have been planned for each isolated population group large enough to justify this. Two such laboratories are now operating, one at Bunbury and one at Albany and four others are planned, one each at Derby, Narrogin, Northam and Geraldton. In addition a small edition of this type of laboratory has been substituted for the long-existing independent laboratory at Wooroloo which has been changed from a tuberculosis hospital to a 200-bedded general hospital with many geriatric patients.

As said, the satellite laboratories confine themselves to investigations requiring urgent answers. All other investigations will be sent by the doctor to the laboratory of his choice.

The reports available from the branch laboratories are as follows :—

1. *Albany.*—Only really began to function in the last few days of 1959. No detailed reports are required.

2. *Bunbury.*—Under the direction of Dr. Szaloky. The continued growth of the Bunbury laboratory in indicative of the great need for this type of ancillary service in the isolated areas. Bunbury laboratory serves over 20 medical practitioners and has a tiny sub-section now established at Busselton to the South. This is the second year of functioning of the Bunbury laboratory and the 1959 work shows a 35 per cent. increase over the previous year, *see* table below. The increase was wholly in public health work, with no increase in the hospital work.

	Bunbury District Hospital	Public Health Department	Total in 1959	Total in 1958	Increase
Bacteriology	707	3,570	4,277	2,781	+ 1,496 = 53·8%
Biochemistry	457	1,388	1,845	1,599	+ 246 = 15·4%
Haematology	823	5,765	6,588	5,011	+ 1,577 = 31·4%
Total	1,987	10,723	12,710	9,391	+ 3,319 = 35·3%

The routine Central Laboratory checks through the year have shown that Bunbury laboratory work is satisfactory in standards and much credit reflects on Dr. Szaloky for his enthusiasm and hard work.

3. *Wooroloo Laboratory.*—Wooroloo hospital, originally a sanatorium, is sited in a country area 40 miles distance from Perth. This hospital has a small independent laboratory which could handle much of the work of a sanatorium but with the change in the nature of the work at Wooroloo the demands on the laboratory were beyond its facilities. Accordingly in 1959 Wooroloo laboratory became part of the laboratory service. A summary of the year's work is given below.

	Commonwealth	Public Health Department	Out-patients and Staff	Total
Bacteriology	215	524	475	1,214
Tuberculosis	687	....	....	687
Haematology	261	589	587	1,437
Biochemistry	57	155	74	286
Histopathology	20	4	....	24
Total	1,240	1,272	1,136	3,648

5.—RESEARCH

The transfer of the Central Laboratory to its new quarters has occupied most of the time available after the carrying-out of that most important work, namely, the routine laboratory investigations. Only a very small amount of research was possible, which is to be regretted since the research of to-day is the routine of to-morrow.

Mention has been made, above, of some of the problems on which it has been possible to carry out research, *e.g.*, improved methods of culturing the tubercle bacillus and of testing its sensitivity to the newer chemotherapeutic agents. Improved methods of testing for water purity ; methods of producing distilled water ; hand-cleansing ; the growth of the Trachoma virus and serology surveys of infected populations ; evaluation of a new test for virus hepatitis ; the effect of tranquilizing drugs on the pregnancy test.

Work not mentioned above includes—

Testing the effect on blood alcohol levels of ageing of the specimen of blood.

A search for fungi in individuals with non-tuberculous chronic chest conditions.

It has long been our belief that fungi play a part in these conditions and it is of interest to record that in the last two autopsy examinations fungi were found in large quantity in the lung tissue on histological examination.

In the future it is hoped to continue the above investigations and to begin work on other pressing problems such as toxoplasmosis. This is a much commoner disease than has hitherto been suspected and it is conceivable that those individuals previously diagnosed as " infectious mononucleosis " with a negative paul-bunnel reaction are almost certainly suffering from toxoplasmosis which except for the serological reactions may be quite undistinguishable from the mononucleosis. Also in the haematology section it is hoped to investigate new methods for the chemical assay of vitamin B12.

There is one important field of research requiring great extension, namely, field surveys. This type of work is increasingly important especially in the North where future large-scale opening-up may well present large-scale medical problems when it is remembered that potential hazards will include malaria, trachoma, amoebiasis, hook-worm infestations, the salmonelloses, etc.

6. PUBLICATIONS

During the year Dr. Kovacs published the following :—

(1) " A Micro Method for Detecting Indol Formation." J. Clin. Path., Jan. 12, 1, 90.

(2) " Salmonellae in Desiccated Coconut, Egg Pulp, Fertilizer, Meat-meal and Mesenteric Glands : Preliminary Report." Med. Jl. Aust., April 25, pp. 557–558.

The publications of Dr. Laurie in 1959 are those dealing with work elsewhere and therefore are not quoted here.

ACKNOWLEDGMENTS

To keep this report within reasonable bounds we must limit our thanks to only a few of the so many who have helped us in the last year. Individuals most deserving of thanks are the laboratory staff and here it is appropriate to quote the laboratory annual report of 10 years ago, " I wish to express my appreciation of the work done by the staff under difficult conditions and particularly that of my Senior Technical Assistant, Mr. A. F. Drummond, whose work as senior staff officer has helped us considerably in the running of the laboratories."

As a newcomer to this country and strange to it's ways I have had to lean heavily not only on the Commissioner of Public Health and on the Under Secretary but on many others, medical and lay, both inside and outside the service of the State. To all of them I am most grateful.

In closing I must particularly thank the Perth Chest Hospital Physician Superintendent and staff for their forbearance and many kindnesses to the large cuckoo in their nest.

Table I

MONTHLY DISTRIBUTION OF EXAMINATIONS EXCLUDING VIROLOGY WORK

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total, 1959	Total, 1958	Increase or Decrease per cent.
General Bacteriology and M. Leprae															
Perth Chest Hospital (Commonwealth)	61	90	105	192	184	310	352	311	248	1,493	767	599	4,712	....	
Royal Perth Hospital	....	....	....	6	10	....	....	....	12	....	2	1	31	318	— 287 = —90·2%
Public Health Dept.	1,057	963	511	629	617	589	1,089	557	1,254	1,141	793	1,139	10,339	....	
Others	....	....	186	175	211	197	224	246	381	479	318	377	2,794	15,059	+ 1,926 = +12·8%
Total	1,118	1,053	802	1,002	1,022	1,096	1,665	1,114	1,895	3,113	1,880	2,116	17,876	15,377	+ 2,499 = +16·2%
Tuberculosis															
Perth Chest Hospital	643	615	583	971	675	610	855	660	739	902	767	617	8,637	2,373	
Royal Perth Hospital	130	131	104	224	171	139	158	113	168	121	90	216	1,765	2,329	
Wooroloo	....	....	9	180	113	149	197	121	168	148	109	163	1,357	....	
Perth Chest Clinic	183	236	121	288	203	256	182	141	121	203	240	274	2,448	....	
Others (including Kalgoorlie)	154	91	139	220	275	204	264	247	257	270	222	280	2,623	5,115	
Total	1,110	1,073	956	1,883	1,437	1,358	1,656	1,282	1,453	1,644	1,428	1,550	16,830	9,817	+ 7,013 = +71·4%
Serology															
Perth Chest Hospital (Commonwealth)	19	25	40	67	55	79	113	81	57	110	59	95	800	....	
Royal Perth Hospital	412	374	341	359	312	314	273	292	328	308	295	350	3,958	6,488	
Public Health Dept.	1,323	1,269	1,167	1,228	1,140	1,397	1,225	1,289	1,714	2,315	1,714	2,214	17,995	....	
Others	117	94	114	120	85	95	56	70	89	90	88	76	1,094	20,674	
Defence	12	111	91	61	53	75	58	65	182	132	130	130	1,100	....	
Total	1,883	1,873	1,753	1,835	1,645	1,960	1,725	1,797	2,370	2,955	2,286	2,865	24,947	27,162	—2,215 = —8·15%
Haematology															
Perth Chest Hospital (Commonwealth)	114	181	170	312	341	486	452	443	343	443	534	620	4,439	....	
Public Health Dept.	....	....	4	107	43	62	....	53	13	63	115	63	523	....	
Others	....	92	129	211	343	486	406	525	883	713	674	661	5,123	....	
Defence	....	....	....	....	....	....	....	....	....	....	22	....	22	....	
Total	114	273	303	630	727	1,034	858	1,021	1,239	1,219	1,345	1,344	10,107	....	
Chemistry															
Perth Chest Hospital (Commonwealth)	4	58	62	97	101	272	246	158	82	320	231	158	1,789	....	
Royal Perth Hospital	....	....	1	14	4	3	1	2	4	1	....	....	30	....	
Public Health Dept.	....	....	....	....	....	....	....	....	19	....	....	....	19	....	
Others	....	6	31	109	73	63	59	82	26	66	68	51	634	....	
Total	4	64	94	220	178	338	306	242	131	387	299	209	2,472	....	
Histopath															
Perth Chest Hospital	....	....	....	....	....	1	1	....	4	12	68	63	149	....	
Royal Perth Hospital	....	....	....	....	....	....	....	....	....	....	4	2	6	....	
Others	....	....	....	....	....	....	....	....	....	1	2	3	6	....	
Total	....	....	....	....	....	1	1	....	4	13	74	68	161	....	
*Virus Laboratories**															
Public Health Dept.	....	....	....	....	....	....	....	....	....	....	....	....	3,428	....	
Royal Perth Hospital	....	....	....	....	....	....	....	....	....	....	....	....	2,761	....	
University	....	....	....	....	....	....	....	....	....	....	....	....	643	....	
Private	....	....	....	....	....	....	....	....	....	....	....	....	313	....	
Others	....	....	....	....	....	....	....	....	....	....	....	....	2,081	....	
Special Investigation	....	....	....	....	....	....	....	....	....	....	....	....	2,445	....	
Total	....	....	....	....	....	....	....	....	....	....	....	....	11,671	....	
Grand Total....	4,229	4,336	3,908	5,570	5,009	5,787	6,211	5,456	7,092	9,331	7,312	8,152	84,064	52,356	+ 31,708 = 60·56

* No separate monthly statements were kept by this Laboratory during 1959.

Table II

BACTERIOLOGY—EXAMINATIONS IN 1959

	Common-wealth	Royal Perth Hospital	Public Health Department	Others	Total
Animal inoculations	16	....	72	16	104
Blood culture	13	4	26	34	77
Blood clot culture	4	....	19	112	135
Brucella cultures	....	....	1	10	11
Burn swab culture	....	....	....	1	1
Cerebrospinal Fluid—(a) Cultures	3	....	1	11	15
(b) Micro	8	1	4	23	36
Dark ground examinations	....	....	11	5	16
Ear and eye swab cultures	18	....	163	23	204
Fluids Serous Cavities—(a) Culture	85	....	4	21	110
(b) Micro	82	....	2	20	104
Faeces—(a) Culture	47	....	310	146	503
(b) Micro	21	....	19	47	87
Fungo examinations	28	....	....	3	31
Gonococci—Smears	12	3	236	193	444
Cultures	14	....	164	123	301
K.L.B.—(a) Cases	16	....	24	169	209
(b) Convalescence	....	....	25	75	100
(c) Carriers	....	....	513	10	523
(d) Contacts	....	....	966	5	971
Throat swabs—not K.L.B.—(a) Culture	27	....	37	76	140
(b) Micro	9	....	21	9	39
Nasal swabs—not K.L.B.—(a) Culture	433	....	205	7	645
Pus cultures	147	....	35	113	295
Strains received for identification	1	....	9	34	44
Sputa—(a) Culture	544	2	8	85	639
(b) Micro	530	2	7	84	623
Urine—(a) Culture	244	....	51	159	454
(b) Micro	277	1	42	169	489
Vaccines	3	....	2	14	19
Vaginal swabs—(a) Culture	16	3	8	47	74
(b) Micro	17	3	8	59	87
Wound swabs	31	....	6	8	45
Sensitivity tests	1,073	2	277	701	2,053
Air dust	....	....	3	....	3
Milk	....	....	13	1	14
Ice creams	....	....	3	....	3
Cool drinks and fruit ice blocks	....	....	1	....	1
Meat (Pies)	....	....	3	....	3
Eggs (fresh)	....	....	3	....	3
Frozen foods—Eggpulp	....	....	630	....	630
Oysters	....	....	276	....	276
Tinned foods	....	....	5	7	12
Fertilizer, animal origin, etc.	....	....	5	....	5
Rat survey	....	....	2	....	2
Sterility tests	50	....	16	....	66
Water—(a) Drinking	....	....	2,141	....	2,141
(b) River, ocean	....	....	1,972	....	1,972
(c) Sewerage	....	....	694	....	694
Moore swabs	....	....	289	....	289
Water—Experimental work	....	10	759	6	775
Blood films—Malaria	....	....	....	8	8
Faeces—Amoeba	12	....	43	40	95
Worms and ova	12	....	44	40	96
Trichomonas—(a) Culture	9	....	56	27	92
(b) Micro	13	....	69	45	127
Membrane filters	....	....	3	....	3
M. leprae	....	....	19	....	19
Miscellaneous	897	....	14	10	921
Total	4,712	31	10,339	2,794	17,876

Table III

TUBERCULOSIS EXAMINATIONS IN 1959

Type of Examination	No. of Examinations
Sputum—	
Direct Smears	1,242
C.D.	4,793
Cultures	5,071
Direct Guinea Pig Inoculations	21
Virulence Tests	10
Gastric Content—	
C.D.	90
Cultures	637
Direct Guinea Pig Inoculations	243
Virulence Tests	1
Laryngeal Swab—	
C.D.	605
Cultures	605
Direct Guinea Pig Inoculations	363
Virulence Tests	1
Pleural Fluid—	
Direct Smears	1
C.D.	118
Cultures	118
Direct Guinea Pig Inoculations	90
C.S.F.—	
Direct Smears	1
C.D.	11
Cultures	11
Direct Guinea Pig Inoculations	6
Urine—	
C.D.	494
Cultures	495
Direct Guinea Pig Inoculations	340
Blood—	
INAH Tolerance Tests	8
Miscellaneous—	
Direct Smears	7
C.D.	298
Cultures	298
Direct Guinea Pig Inoculations	262
Virulence Tests	39
Sensitivity Tests	551
Total Examinations	16,830

Table IV

VIRUS LABORATORY EXAMINATIONS

	Public Health	Royal Perth Hospital	University	Private	Others					Special Investigations			Total
					Princess Margaret Hospital	King Edward Memorial Hospital	Fremantle Hospital	Sunset Home	Commonwealth	Trachoma	Quokka	Herpes	
Preparation of Inocula	27	69	13	13	45	....	1	....	....	294	5	....	467
Tissue Culture	638	663	48	76	861	4	14	57	....	15	....	2	2,378
Chick Embyro	1,266	846	340	79	266	....	....	46	62	1,418	71	....	4,394
Suckling Mice	532	435	124	98	323	....	8	14	25	8	60	....	1,627
Adult Mice	148	37	33	24	24	....	....	....	....	66	48	....	380
Rabbit Inoculation	....	....	....	....	....	....	....	....	....	....	15	....	15
Guinea Pig Inoculation	....	....	....	....	....	....	....	....	....	....	10	....	10
Neutralisation	18	....	....	....	22	....	....	....	....	....	....	....	40
Haemadsorption	9	65	13	....	99	....	1	3	....	....	....	....	190
Haemagglutination	691	564	31	14	79	....	....	67	17	....	....	....	1,463
Serological Tests	....	....	....	....	6	....	....	....	....	....	....	....	6
Haemagglutination Inhibition	9	35	....	....	....	....	....	....	....	....	....	....	44
Sterility Tests	82	47	41	7	27	....	....	3	5	428	5	....	645
Plates	8	....	....	2	2	....	....	....	....	....	....	....	12
Total	3,428	2,761	643	313	1,754	4	24	190	109	2,229	214	2	11,671

Table V

EXAMINATIONS—SEROLOGY DEPARTMENT

	Defence	Common-wealth	Royal Perth Hospital	Public Health	Other	Total
Serology						
Wassermann Reaction	305	134	879	3,915	....	5,233
Kahn Tests—						
(a) Qualitative	293	126	728	3,335	....	4,482
(b) Quantitative	....	....	....	2	....	2
Cardiolipin Tests	301	124	865	3,388	....	4,678
Meinicke Clearing Reaction	51	20	211	405	....	687
Gonococcal Complement Fixation Test	95	87	151	1,076	....	1,409
Hydatid Complement Fixation Test	4	2	15	22	....	43
Widal Reactions	4	114	404	2,020	....	2,542
Weil Felix Reactions	1	34	131	359	....	525
Abortus Agglutinations	1	34	132	366	....	533
Antiglobulin Test for Brucellosis	....	2	18	6	....	26
Anti-Streptolysin O Titre	1	11	91	29	78	210
Paul Bunnell Test	....	16	41	71	29	157
C. Reactive Protein	1	8	92	95	3	199
Rose and Ball Tests	41	9	66	261	....	377
S. typhi Vi—						
(a) Agglutination Test	....	4	4	340	....	348
(b) Coombs Test	....	....	....	2	....	2
Donath Landsteiner Reaction	....	....	....	1	....	1
Leptospire Agglutinations	....	5	1	74	....	80
Venipunctures	....	42	....	216	....	258
Haemagglutination Tests—						
(a) Influenza	....	....	....	750	....	750
(b) Infectious Hepatitis	....	....	3	111	....	114
(c) Cold Agglutinins	....	12	6	1	....	19
Q. Fever Agglutination Test and C.F.T.	....	1	3	15	....	19
Complement Fixation Tests—						
(a) Influenza	....	....	....	138	....	138
(b) Psittacosis	....	3	13	170	....	186
Hormone Tests						
Toad Tests—						
(a) Qualitative	2	12	102	280	969	1,365
(b) Quantitative	....	....	2	3	15	20
Friedman Tests	....	....	....	5	....	5
Aschheim-Zondek Tests—Qualitative	....	....	....	1	....	1
Medico Legal						
Chemical Tests for Blood	....	....	....	156	....	156
Serological Tests for Blood	....	....	....	76	....	76
Blood Grouping	....	....	....	15	....	15
Hair	....	....	....	100	....	100
Semen Examination—						
(a) Chemical	....	....	....	67	....	67
(b) Micro	....	....	....	70	....	70
Identification of Animal Protein	....	....	....	46	....	46
Court Appearances	....	....	....	12	....	12
Total	1,100	800	3,958	17,999	1,094	24,951

Table VI

BIOCHEMISTRY SECTION

	Common-wealth	Royal Perth Hospital	Public Health	Others	Total
Serum or Plasma Investigation	1,308	3	16	521	1,848
Cerebrospinal Fluid Investigation	53	27	2	47	129
Gastric Contents	8	....	....	6	14
Faeces Examinations	81	....	1	16	98
Pleural and Ascitic Fluids	62	....	....	5	67
Urine Examinations	215	....	....	34	249
Metabolic Tests	59	....	....	5	64
Others	3	....	....	....	3
Total	1,789	30	19	634	2,472

Table VII

HAEMATOLOGY DEPARTMENT, PUBLIC HEALTH LABORATORIES—EXAMINATIONS IN 1959

	Defence	Common-wealth	Royal Perth Hospital	Public Health Dept.	Others	Total
Total RBC	2	54	....	34	362	452
HC. Level	2	708	....	58	564	1,332
Haematocrit Levels (PCH)	2	344	....	52	518	916
ESR	2	263	....	51	398	714
MCH	2	44	....	32	357	435
MCV	2	44	....	32	356	434
MCHC	2	63	....	31	358	454
Blood Film Examination	2	293	....	52	487	834
Fragility Testing	....	2	....	....	1	3
Reticulocytes	....	25	....	11	209	245
Stipple Cells	....	....	....	29	1	30
WBC	2	748	....	59	490	1,297
Differential	2	734	....	57	486	1,279
Blood Grouping A.B.O.	....	224	....	2	65	291
Blood Grouping R.L.	....	225	....	2	65	292
Compatibility Testing	....	216	....	....	....	216
Prothrombin Time	....	257	....	....	70	327
Bone Marrow Examination	....	....	....	....	6	6
Bleeding Time	....	16	....	....	1	17
Clotting Time	....	30	....	....	....	30
Clot Retraction Time	....	2	....	....	....	2
Platelet Counting	2	35	....	17	299	353
L.E. Cell Examinations	....	14	....	3	26	43
Others (Malaria, Filariasis Films Vein Punctures, etc.)	....	98	....	3	4	105
Total	22	4,439	....	523	5,123	10,107

Table VIII

HISTOPATHOLOGY EXAMINATIONS

	Common-wealth	Public Health Department	Royal Perth Hospital	Others	Total
Cytology	105	37	6	6	154
Post-mortems	....	7	....	....	7
Total	105	44	6	6	161

Appendix III

TUBERCULOSIS CONTROL BRANCH

Report of the Director to the Commissioner of Public Health

I have the honour to submit my report on the activities of the Branch for the year ended 31st December, 1959. As in previous years I am reporting under the following headings :—

(1) Records and statistics.
(2) Prevention.
(3) Case finding.
(4) Medical care and isolation.
(5) Social and economic protection.
(6) Rehabilitation.
(7) Developments and comments.
(8) Conclusion.

(1) RECORDS AND STATISTICS

STATISTICAL TABLE

Year	Mean Population 1,000s.	Notifications				No. on Register Pulm.	Prevalence per 100,000 Pulm.	Number Receiving T.B. Allowance	Deaths			Death Rate per 100,000	
		Pulm.	Non-Pulm.	Total	Pulm. per 100,000				Pulm.	Non-Pulm.	Total	Pulm.	All Forms
1950	558	586	18	604	104·8	2,100	376	515	125	3	128	22·4	22·9
1951	580	467	37	504	80·4	2,402	413	474	76	6	82	13·1	14·1
1952	601	508	49	557	84·2	2,574	428	396	75	7	82	12·5	13·6
1953	621	378	34	412	60·6	2,762	445	361	43	3	46	6·9	7·4
1954	640	348	34	382	54·3	2,769	432	326	57	4	61	8·9	9·5
1955	659	413	39	452	63·7	2,965	450	330	31	2	33	4·7	5·0
1956	677	424	44	468	62·6	2,900	428	264	43	3	46	6·3	6·8
1957	692	332	32	364	47·9	2,786	403	198	36	1	37	5·2	5·3
1958	706	355	24	379	50·3	2,726	386	213	22	4	26	3·1	3·4
1959	726	320	34	354	44·1	*2,684	369	182	24	....	24	3·3	3·3

* Known Born outside Australia—989.

The annual mortality rate for pulmonary tuberculosis remains at the low figure of 3·3 per 100,000 of the population.

There were only two deaths in persons under the age of 50 years, and nine under the age of 60.

The number of notifications of pulmonary tuberculosis decreased slightly to 320. There were only six notifications under the age of 20 years, only one, a native girl of 19 years, had evidence of active disease, two had pleural effusions, the other three had minimal disease.

The notifications (which included 27 re-notifications) comprised 237 males and 83 females.

*Of the males, 73 were notified with " Minimal " disease, 112 with " Moderate " and 45 " Advanced," and there were 8 pleural effusions. Of the females, 31 were considered to have disease of " Minimal " extent, 39 " Moderate " and 16 " Advanced," and there were 3 with pleural effusions.

The maximum incidence in men was again in the 45–60 age group, and in women the 25–40 group.

The number of sufferers from pulmonary tuberculosis on the Case Register at 31st December, 1959 again decreased slightly and the prevalence of the disease has now dropped to the figure of 369 per 100,000 of the population.

Of the 416 removed from the Case Register during the year, 213 were removed as being inactive from three to five years (three years after complete resection of disease) in 56 a revised diagnosis had been made, 44 had transferred out of the State, 5 were untraceable and there were 98 deaths (24 due to tuberculosis and 74 from other causes).

At the end of the year, there were 182 persons in receipt of the Commonwealth Tuberculosis Allowance, 155 males and 27 females ; the lowest number yet recorded.

There were 34 notifications of non-pulmonary disease during the year and 108 non-pulmonary cases on the Register at the end of the year (but this Register is not subject to continuous review as is the Register of Pulmonary Disease). Thirty-six of the 108 were born outside Australia.

During 1959 a total of 91,036 micro films were taken, bringing the total since 1952 (excluding hospitals) to 995,836.

A total of 13,231 large films, 17 in. x 14 in., were taken at the Perth Chest Clinic, bringing the total since 1948 to 132,431.

*Annual Notification of Pulmonary Tuberculosis showing Stage of Disease**

	Percentage of Parenchymal Disease						Total	Pleural Effusion as per cent. of Total	
Year	Minimal		Moderately Advanced		Advanced				
		%		%		%			%
1952	122	24	275	54·1	101	19·9	508	10	2
1953	98	25·9	210	55·5	65	17·2	378	5	1·4
1954	96	27·6	178	51·1	74	21·3	348	....	....
1955	111	26·9	225	54·5	64	15·5	413	13	3·1
1956	127	38	217	51·1	72	17	424	8	1·9
1957	102	30·7	163	49·1	61	18·4	332	6	1·8
1958	91	25·6	187	52·7	72	20·3	355	5	1·4
1959	103	32·2	151	47·2	55	17·2	320	11	3·4

* Classified according to Diagnostic Standards N.T.A.

(2) PREVENTION

Preventative measures were carried out as in previous years, by home visiting, chest x-ray examination of adult household contacts, and Mantoux testing of child contacts and persons at risk, with B.C.G. vaccination of negative reactors, and prophylactic treatment of positive reactors ; details of which are shown in the attached report of the Tuberculosis Physician.

The general level of housing in the community now appears so satisfactory and houses so readily available that, for the first time, no special measures were required during the year to improve conditions in specific instances.

"*Morriston*" *Preventorium*

The number of admissions during the year dropped to 21 and the bed average to 8. It is pleasing to note the gradual falling off in the demand for admissions of babes and infants of T.B. mothers.

After the opening of Morriston in 1950, the peak number of admissions to 52 was reached in 1952, dropping gradually to 36 by 1956, and to 21 during 1959.

Action under Sections 293 *and* 294 *of the Health Act*

Twenty-six persons were required to submit to x-ray examination for tuberculosis ; twenty of these subsequently reported and resumed out-patient clinic attendance where necessary, and one was immediately admitted to hospital. One person was excused examination for a further period, three had left the State, and in two, action was incomplete at 31st December, 1959.

(3) CASE FINDING

(i) *Mass Radiography*

The second compulsory chest x-ray survey of the Metropolitan area was continued with completion of surveys of Melville, Belmont and Canning Road Boards and the City of South Perth.

A total of 39,413 persons were examined on 70 mm. Mirror Camera film with discovery of 30 cases of significant pulmonary tuberculosis, an incidence of ·8 per 1,000.

The survey was continued into near Metropolitan areas, with coverage of Gosnells, Armadale-Kelmscott, Cockburn, Kwinana and Rockingham Road Boards.* In this series, 11,621 were examined with discovery of 12 significant cases of pulmonary tuberculosis, a finding of 1 per 1,000.

The second compulsory Metropolitan survey which finished with the South Perth survey (and excluding near Metropolitan Centres) examined a total of 188,866 persons and resulted in the discovery of 129 sufferers with significant pulmonary tuberculosis, a further 111 suspect cases requiring out-patient observation as at 31st December, 1959, 48 persons suffering from carcinoma of the lung and 913 other abnormalities. (Persons listed during the first survey with " other abnormalities " were not recorded again if the same condition was apparent).

Country surveys were carried out during the year at York, Northam, Phillips River, Port Hedland, Roebourne, Ashburton, Upper Gascoyne, Carnarvon and Shark Bay Road Board Districts.†

A total of 9,685 persons were examined and 12 found to have significant pulmonary tuberculosis, requiring admission to hospital.

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* *Centres.*—Anchorage Butchers, Armadale, B.H.P. Works, B.P. Refinery, Byford, Canning Vale, Coogee Beach, Cockburn Cement Works, Eventide Home, Gosnells, Hamilton Hill, Jandakot, Kelmscott, Kenwick, Maddington, Medina, Orange Grove, Rockingham, Roleystone, Safety Bay, South Coogee, Spearwood, S.E.C. Power House, Watson's Factory, W.A. Meat Export Works.

† *Centres.*—Bakers Hill, Boolaloo, Carnarvon, Clackline, Gascoyne Junction, Grass Valley, Hopetoun, Northam, Onslow, Point Samson, Port Hedland, Ravensthorpe, Roebourne, Shark Bay, Spencers Brook, Wundowie, York.

(ii) *Referred by Medical Practitioners to Perth Chest Clinic*

(a) *Metropolitan Area*

The number of patients referred of 4,279 (including 3,318 large and 961 micro film examinations) was a considerable increase on the previous year, 3,430 ; and resulted in the discovery of 12 cases of pulmonary tuberculosis admitted to hospital, 1 treated as an out-patient and 8 suspects as at 31st December, 1959 ; apart from 23 persons with carcinoma of the lung and 747 other abnormalities.

The incidence of significant tuberculosis of ·3 per cent. is slightly lower than in the previous two years.

(b) *Country Areas*

The number of 17 in. x 14 in. films sent for consultative opinion increased by 14 per cent. to 8,151, and resulted in the discovery of 24 sufferers with pulmonary tuberculosis, 22 regarded as suspects at 31st December, 1959 requiring follow-up action, 23 with carcinoma of the lung, and 788 other abnormalities.

Drs. A. E. Vivian of Albany, W. Lawson Smith of Bunbury, J. R. Hankey of Collie, A. J. Beaumont of Geraldton, A. McL. Robinson of Northam and W. J. Grey of Merredin, continued to support the work of the Department as Tuberculosis Officers in these districts.

(iii) *Migrants*

The Commonwealth Health, Immigration and Customs Departments again assisted in the assessment of tuberculosis in new arrivals. There were 13,839 arrivals during the year, 9,380 British full fare paying passengers (including 3,500 returning Australians), 1,862 assisted British migrants and 2,597 Aliens.

Over 2,000 reported for chest x-ray as a result of issue of pamphlets, and 382 large films were submitted and re-checked. The fall in the latter number is due to the fact that these films are now mostly checked abroad.

During the year, of the total notifications of 320, there were 116 notifications of pulmonary tuberculosis in migrants. Of these, 56 had arrived since 1948, comprising British full fare 9, British assisted 14, Alien full fare 18, Alien assisted 13, British seamen 1, Chinese seamen 1.

These 56 notifications resulted from voluntary and routine chest x-rays 13, as a result of pamphlets 12, referred by medical practitioners 4, compulsory chest x-ray survey 7; transfers from overseas or interstate 5, followed up for more than one year 9, referred by hospitals 6 including 2 admitted direct from ship.

Of these 56 notifications, 12 arrived during 1959, consisting of British full fare 3, British assisted 3, Alien full fare 3, Alien assisted 1, British seamen 1, Chinese seamen 1. Forty of the 56 were admitted to hospital for treatment.

In addition, there were an additional 8 migrants notified with non-pulmonary disease, 7 of whom had arrived since 1948.

The apparent relative increase of notifications in migrants is the result of more accurate research in the determination of country of birth.

(iv) *Hospital Chest X-Ray Examinations*

The Medical Superintendent of the Royal Perth Hospital reports that no systematic routine micro filming was possible but large film examination of suspect patients resulted in 17 notifications of pulmonary tuberculosis.

At the Fremantle Hospital there were 10 notifications reported by the Superintendent from 2,850 17 in. x 14 in. films and 357 35 mm. micro films.

The St. John of God Hospital, Subiaco, carried out 35 mm. micro film examinations as a routine, and one patient suffering from extensive pulmonary tuberculosis was discovered from 2,507 examinations.

At the King Edward Memorial Hospital, only 627 routine ante-natal films were carried out—as a result of routine Tuberculin (Mantoux) tests being instituted, and examinations being only carried out on positive reactors—no abnormalities of significance were disclosed.

(4) MEDICAL CARE AND ISOLATION

Perth Chest Hospital

The Perth Chest Hospital, since its opening in August, 1958, has now settled down into normal operation.

The first full year's operation, as shown in the report of the Physician Superintendent, Dr. Elphick, shows 411 admissions for tuberculosis. This is almost double that of preceding years to Wooroloo Sanatorium, and is due to the Chest Hospital taking the load of initial admissions previously handled by metropolitan general hospitals.

There have been no new developments in regard to treatment and this is standard with Streptomycin, Isoniazid and P.A.S. in the majority of patients. The place of surgery is well defined ; it is now more of an adjuvant to drug treatment rather than, as in earlier years, a necessity. The average stay in hospital for the patient with established pulmonary tuberculosis of 28 weeks is much less than previous years, due to earlier commencement of domiciliary treatment which is advisably still long-term to prevent relapse of disease.

The one disquieting feature is the appearance of a definite percentage of patients showing infection with atypical tubercle bacilli, which are more resistant to drug treatment, even when treated as well with the lesser effective drugs, Viomycin, Kanamycin, Pyrazinamide, etc. The atypical organism appearing in this State is the so-called " Battey " Group III Non-Photochromogenic type, which has also become apparent in some states in the U.S.A. and elsewhere.

It is not sure whether this organism has appeared as a result of " selection," due to effective treatment and control measures, or is a mutant. Fortunately, it is probably not so infective as the typical tubercle bacillus.

Royal Perth Hospital

There were 43 patients admitted during the year with tuberculosis of some form or other ; including 14 from Perth Chest Hospital and 6 from Wooroloo Hospital for treatment of associated conditions.

Wooroloo Hospital

As at 31st December, 1959, there were 29 elderly male and 2 female inmates of the T.B. Section of this geriatric institution.

There were 32 transfers to the Perth Chest Hospital, 4 to Wooroloo, 1 to the Repatriation General Hospital, Hollywood. There were 4 discharged home and 4 deaths.

Fremantle Hospital

There were 2 patients only admitted during the year, 2 transferred to the Perth Chest Hospital, 1 to Wooroloo and 1 discharge.

Princess Margaret Hospital for Children

Only 6 patients were treated during the year with tuberculous glands of the neck.

There were no admissions for pulmonary disease.

Claremont Mental Hospital

Annual surveys have kept the position under control. At 31st December, 1959, there were 29 males and 20 females, (17 with active disease) in the T.B. Block ; and 57 patients elsewhere in the Hospital were undergoing regular reviews.

Out-Patient Clinics

Perth Chest Clinic

The number of attendances of actual clinic appointments including T.B. out-patients at the Monday, Wednesday and Friday morning clinics, dropped further during the year to 2,858, compared with 3,222 in 1958 and 3,788 in 1956.

The lessening of this aspect of clinic work has enabled an improvement in the service to practitioners referring patients to the Clinic—as mentioned in the report of the Tuberculosis Physician and since October all films are read immediately, patients examined if necessary, and a report sent to the physician concerned without delay.

The Surgical Clinic held on the Thursday morning totalled 83 special consultations over the year.

Domiciliary treatment was continued in a number of patients but the number (receiving treatment during the year) dropped to 460 compared to the previous year's figure of 467.

Fremantle Chest Clinic

The out-patient clinic is held on one morning a week and 476 patient attendances were recorded.

A total of 493 patients were referred by local practitioners for chest X-ray examination and 2 were found to be suffering from pulmonary tuberculosis—an incidence of 0·4 per cent. ; and 293 had other abnormalities.

A total of 6,508 micro film exposures were made (including some reporting for compulsory surveys) and 2,580 large films were taken.

Twenty-two sufferers from pulmonary tuberculosis were recorded through this clinic (including 9 from mass survey, 2 from practitioners, 2 migrants reporting as a result of pamphlets, previously recorded in this report under respective case finding activities), 6 from clinic follow-up activities, and 3 reported voluntarily for chest X-ray examination.

Kalgoorlie Chest Clinic

The Chest Physician, Kalgoorlie, after three years work there, has a grasp of the problem of tuberculosis and silicosis in the goldmining community and has now been able to write an analytical appreciation of the position as he sees it. Apart from our activities in tuberculosis case finding to discover the infectious sufferer to break the cycle of infection, it is obvious that the problem " goes much deeper " and much more work must be done on the preventative aspect of lung disease in goldminers.

Dr. McNulty reports :—

" Number of cases on roll as at 31st December, 1959	182
Number of cases deceased during the year (T.B. and other causes)	17
Number of cases transferred during the year	8
Number of cases de-notified during the year	16
Number of cases active T.B. notified during the year	44
Number of patients admitted Repatriation General Hospital during the year	16
Number of patients admitted Perth Chest Hospital during the year	50
Number of miners chest X-rays examined during the year	7,269
Number of non-miners chest X-rays examined during the year	3,180

Despite intensive investigation and follow-up of all abnormal chest x-rays in the goldfields area, pulmonary tuberculosis remains a problem. This appears to be mainly due to the persistently high incidence of infectious tuberculosis among miners and ex-miners. It would appear that at least one miner in every 60 who ever entered the industry has developed pulmonary tuberculosis, and one in every 30 has developed silicosis. Because of the large number of workers who develop silicosis and/or tuberculosis after leaving the industry, these figures probably understate the problem. At the moment, there are 600 miners and ex-miners (registered under Section 50, M.W.R.A.) and probably many other hundreds (not so registered) suffering from silicosis. All of these are potential candidates for pulmonary tuberculosis, and only regular radiological, clinical and bacteriological examinations will determine those with the superadded infectious element. It was hoped that a short-cut could be found to detect those likely to develop pulmonary tuberculosis but this appears unlikely. The general work of the clinic in the diagnosis, aftercare, etc., of tuberculosis has been continued but the acute and chronic respiratory diseases of miners tend to take up more clinic time.

Separate reports have been issued on industrial chest diseases in goldminers and on Asbestosis in workers at Wittenoom." * see Adenda.

Bacteriology

Perth and Fremantle Clinic records show the following investigations were carried out through the Clinics :—

	No. of Tests.	Individuals.
1. Sputum Examinations	1,460	509
Positive for M. tuberculosis	35	17
Atypical organisms	23	14
2. Gastric contents	140	57
Positive for M. tuberculosis	18	8
Atypical organisms	8	4
3. Laryngeal swabs	209	103
Positive for M. tuberculosis	4	2
Atypical organisms	4	2

Dental Clinic (*Perth Chest Clinic*)

The Dental Clinic staffed by courtesy of the Perth Dental Hospital continued to function as required and 158 procedures were carried out for 160 patients.

(5) SOCIAL AND ECONOMIC PROTECTION

The Commonwealth Government again showed its determination to let nothing impair the National Campaign Against Tuberculosis and to keep pace with increased costs of living, on 8th October, 1959, the Tuberculosis Allowance was increased to £11 2s. 6d. per week for the married sufferer with dependent wife, with 10s. for each dependent child ; and £4 15s. for the single sufferer in hospital and £6 17s. 6d. if undergoing domiciliary treatment. Permissible income remained at £7 per week for married male patients (as between husband and wife) and £3 10s. per week for single persons.

As at 31st December, 1959, there were 182 persons in receipt of the Tuberculosis Allowance comprising 155 males (123 in hospital) and 27 females (18 in hospital).

One hundred and sixteen of the number were Australian born, 66 were migrants of whom 33 had arrived since 1948, (11 displaced persons, 10 Europeans, 6 English, 3 Anglo-Indians, 1 New Zealander and 2 Dutch) and 33 arrived prior to 1948.

(6) REHABILITATION

There appeared to be a definite increase during the year in the number of patients requiring assistance in this regard, due to economic conditions in the State. The Senior Medical Officer and Rehabilitation Officer of the Commonwealth Department of Social Services report interviews with 42 patients, 22 commencing training, and 23 placed in employment during the year, with 11 in training as at 31st December, 1959.

The officer-in-charge of the Physically Handicapped Section of the Commonwealth employment service, reports interviews during the year with 185 ex-T.B. patients (172 male and 13 female) and that 62 were helped obtain positions (the latter figure including the 23 mentioned in the previous paragraph).

The Tuberculosis Association of W.A. again also assisted in this field by the operation of their Sheltered-Transition workshop, as mentioned in the report of the Tuberculosis Physician.

(7) DEVELOPMENTS AND COMMENTS

A development of note during the year was the approval on 30th September, 1959 (as necessary under the Commonwealth-State arrangement), by the Commonwealth Minister for Health, for the use of a small number of beds at the Perth Chest Hospital for the treatment of non-tuberculous conditions. This had become possible due to the quicker turnover of T.B. patients due to present methods of investigation and treatment.

Although only in operation for three months of the year, the value of this service to the medical profession and the community is shown by the fact that some 25 per cent. of total admissions during the year were for such patients (including those admitted during the year for investigation in which the diagnosis of tuberculosis was excluded from the differential diagnosis).

The Pulmonary Function Laboratory became fully operational during the year and has established itself as an essential adjuvant to diagnosis and treatment of chest disease. Dr. Heymanson's following report provides an interesting review of the development and present position of the physiological aspects of chest medicine.

I refer you, Sir, to the attached report of the Matron of the Chest Hospital, Matron Anstey. Although this must be regarded as a short preliminary report, Matron is in fact, carrying out a research programme into current nursing techniques, and although the Chest Hospital is a " mixed " hospital catering for both long-term and short-term patients, the fact that it is efficiently run with a nurse : patient ratio including student nurses, of ·6 : 1, is worthy of note in these days of high hospital costs.

The points raised by the recently appointed Tuberculosis Physician, Dr. Edwards, show the necessity for continued vigilance in the supervision of clinic out-patients under domiciliary treatment, in the appraisal of case finding in special groups and in this regard it is obvious further steps must be taken to encourage routine hospital admission chest X-rays ; and in further development of prophylactic treatment of Tuberculin positive schoolchildren.

The fact that well over one-third of the annual notifications of pulmonary tuberculosis occur in migrants, which comprise approximately only one-quarter of the population of the State, is worthy of note, *i.e.*, an annual notification rate of 64 per 100,000 of the migrant population compared to 37 per 100,000 in the native born Australian.

CONCLUSION

As this report coincides with my completion of 10 years in office as Director of Tuberculosis Control measures, it is with pleasure I record that in this period, even with intensification of case finding procedures, the yearly Notification Rate of Pulmonary Tuberculosis has been cut by half, from 105 to 44 per 100,000 of the population, and the Death Rate sevenfold, from 22 to 3 per 100,000 of the population.

The control thus achieved to date over this infectious disease would not have been possible without the capital and maintenance expenditure (*see* separate tables) provided by the Commonwealth Government under the Commonwealth-State Agreement, allowing the free treatment of the tuberculous sufferer with payment of the Tuberculosis Allowance when necessary ; together with the assistance of the medical profession and the support by the community of the compulsory chest X-ray programme.

The number of persons still being discovered suffering from pulmonary tuberculosis warrants continuation of existing measures.

The co-operation of the Repatriation Commission and the special help of the Chest Specialist of the Commission in this State, Dr. W. Harris, is acknowledged.

My thanks are due to all members of the staff of the Branch and the Department who have contributed to the presentation of this report.

ALAN KING, B.Sc., M.B., B.S., F.C.C.P.

Appendix IV

REPORT OF THE TUBERCULOSIS PHYSICIAN

The Director,

Tuberculosis Control Branch.

I have pleasure in presenting the following report on the activities of the Perth and Fremantle Chest Clinics for the year 1959.

CASE FINDING

Micro Films : In August compulsory mass X-raying of the metropolitan area was completed for the second time. Thereafter miniature filming proceeded at a quieter level.

The total number of micro films taken during the year (mostly 70 mm. size) was 91,036. A total of 1,420 people were recalled for large films, making a recall rate of 1·6 per cent. From these recalls 73 cases of active Tuberculosis were discovered, 13 of lung carcinoma and 497 other conditions. Voluntary and compulsory micro filming thus remains a fruitful source of Tuberculosis cases.

Large Films : 15,809 films were taken, of which 3,811 were initial X-rays done at Perth and Fremantle Clinics at the request of Private Practitioners in the metropolitan area. From these Practitioners' patients 15 cases of Tuberculosis were discovered (representing a rate of 4 per 1,000), 23 of lung carcinoma and 840 other conditions.

Clinic Attendances : Since October an attempt has been made to provide more efficient service to private practitioners sending in their patients for large films. In this group all X-rays are read wet before the patient leaves the Clinic. If any abnormality is noted he is immediately interviewed and examined and his doctor informed of the findings. In the last three months of this year an average of 22 patients daily were clinically examined at Perth Chest Clinic. At Fremantle the average attendance at the weekly clinic was 10.

FOLLOW UP—VISITING SISTERS

The Clinic Sisters continued actively with preventive and control work, including checking of contacts and vaccination of the negative reactors. They made 4,437 visits to 1,851 patients living in the Perth and Fremantle areas. Only 5 patients with positive sputum were being supervised at home, all under approved conditions.

Drug Treatment : The number of patients at the end of the year under home treatment with anti-tuberculous drugs (usually P.A.S. and Isoniazid) was 237. A concentrated effort was made by Sisters and Doctors to ensure that P.A.S. was taken adequately, as being of great importance in the maintenance of suppressive follow-up drug therapy, especially in preventing the emergence of Isoniazid resistance. To this end, 122 urine tests for P.A.S. were done. These were " sprung " on patients on the occasion of routine visits to the Clinic. Despite close home supervision, 31 tests proved negative, suggesting that probably 30 per cent. of the patients had been taking P.A.S. inadequately. This finding is in line with experience in other countries and must be a big factor causing future breakdown in apparently controlled cases. P.A.S. seems to be a very unsatisfactory drug for home administration.

Tuberculin Testing and B.C.G. Vaccination : Vaccination was confined to child contacts and groups at special risk.

The following are the figures for the year :—

Total number of Heaf Gun Tests	1,879
Positive reactors	441
Negative reactors	1,412
Did not attend for reading	26
Received B.C.G. vaccination	589
Enlarged glands following vaccination	9

The incidence of gland involvement does not appear to be unduly high despite a recent increase in viable organisms in the freeze-dried vaccine.

PROPHYLAXIS

Twenty-one child positive reactors—nearly all under 8 years old—were given a 12 months course of P.A.S. and Isoniazid. All were contacts of known adult cases. This brings the total to 66 since we began treating these children in 1955.

REHABILITATION

As liaison medical officer to the Tuberculosis Association, I wish to report that 24 ex-patients were employed at the Association's Federal Cardboard Box Factory during the year, made up as follows :—

Remaining at Box Factory at 31/12/59—	
Permanent	6
Temporary	4
Left Box Factory during year—	
Returned to previous employment	2
Obtained new employment	10
Still unemployed at 31/12/59 (registered with Commonwealth Employment)	2
	24

FUTURE PLANNING

Judging from the falling mortality rate alone in the last few years, Tuberculosis in this State appears to have been brought under a high degree of control. In order to maintain and possibly improve this, it is suggested that special attention be given to the following points :—

1. Stricter control of domiciliary chemotherapy, particularly through the Visiting Sisters.
2. Regular bacteriological checking of old apparently controlled cases, say at six-monthly intervals.
3. Continuation of mass community X-ray surveys in view of their continuing high percentage yield of active cases in comparison to other sources.
4. Re-appraisal from time to time of the necessity for regular X-raying of groups *either* at special risk *or* at possible risk to others by virtue of their special position in the community, *e.g.*, Merchant Seamen and Schoolteachers.
5. Maintaining and possibly extending the principle of preventive treatment in child positive reactors. Recent work abroad has shown that in young people up to the age of 25, strongly positive reactors as a group are at highest risk of developing active Tuberculosis in later life.
6. Keeping the public and profession informed of the continuing significant morbidity of Tuberculosis despite vigorous control measures.
7. An attempt to estimate the prevalence and infectivity of the so-called atypical mycobacteria in this State.

F. G. B. EDWARDS, B.A., LL.B., M.B., B.S.,

Tuberculosis Physician, Tuberculosis Control Branch.

Appendix V

REPORT OF THE PHYSICIAN SUPERINTENDENT, PERTH CHEST HOSPITAL

The Director,
Tuberculosis Control Branch,
Perth Chest Clinic,
17 Murray Street,
Perth.

I have the honour to present the annual report for Perth Chest Hospital for the year ending 31st December, 1959.

On 1st January, the sixth ward of the hospital was opened, making a total of 162 beds available for investigation and treatment. The seventh ward was staffed and opened on 1st April, and on 29th June, the last of the eight wards was opened, and since that date the full complement of 216 beds have been in full operation. As from 1st October, with the Commonwealth's approval to admit a small number of cases of non-tuberculous respiratory disease, one ward was devoted entirely to the investigation and treatment of such cases, who may thus be completely segregated from the tuberculous patients, and an interesting variety of chest diseases has been admitted for investigation and treatment.

With the full operation of the 216 beds it immediately became obvious that more medical staff would be essential, in view of the number of cases admitted for investigation and assessment. Taking into consideration the necessity for undergraduate, and if desired, postgraduate teaching, it was estimated that our full-time medical staff should consist of three consultants, including the physician superintendent and assistant physician superintendent, and four 2nd or 3rd year, or grade 1 medical officers. Of these it was felt that two or three should be temporary officers, appointed for terms of six or twelve months, during which time every effort should be made to afford them as much teaching in diseases of the chest, particularly tuberculosis, as possible. Appointments to the medical staff included Dr. Janet Elder, as a consultant physician, and Dr. V. Dadds as a third year medical officer. Dr. F. E. Heymanson was transferred to the Chest Hospital early in the year from the Tuberculosis Control Branch, as a physician. He has been fully occupied throughout the year in the establishment of a most excellent pulmonary function laboratory, which has assisted materially in the investigation and assessment of a large number of our patients. A review of his activities together with an outline of his projects for the future has been received by you.

TREATMENT

Chemotherapy

As a routine, all patients on admission, following initial investigation, are given Streptomycin 1 gram, Isoniazid 200 or 300 mgm. and P.A.S. 12 grams daily in combination. The three drugs are continued until the results of sensitivity tests are available, further chemotherapy thereafter being adjusted in accordance with the directions indicated by the sensitivity tests. When the organisms are fully sensitive, the usual routine is for daily Streptomycin and Isoniazid to be continued until just prior to the patient's discharge, when P.A.S. is substituted for Streptomycin, and continued in conjunction with Isoniazid after the patient's discharge, a total of two years treatment being recommended as a minimum for the adequate control of the disease. As a result of this regime, it is possible in all forms of typical tuberculosis to offer almost 100 per cent. chance of complete control or " cure " of the disease, provided that the drugs are faithfully taken throughout the full period required.

Atypical Mycobacteria

Over the past two to three years an increasing number of patients have been seen with radiological appearances suggestive of tuberculosis, in whose sputum the only organisms discovered are atypical Mycobacteria, which resemble tubercle bacilli in all but their finer biochemical and cultural characteristics. The majority of these atypical organisms are completely resistant to all chemotherapeutic agents, and the problem presented by such cases threatens to be a serious one. The organisms are found in some instances in association with non-specific chronic pulmonary conditions such as silicosis, bronchiectasis and fibrosis due to other causes, and occasionally even in old, apparently inactive cases of tuberculosis, in whom they appear to be secondary invaders of doubtful clinical significance. In other instances patients present symptoms, physical signs and radiological appearances identical with those of typical tuberculosis, and in these it would appear that the atypical organism is in fact the causative agent and not merely a " contaminant," as evidenced by the discovery of the organisms within, and culture of them from, the lesions of resected segments which histologically appear characteristic of classical tuberculosis. A brief summary of the history and findings of cases representative of those treated in the hospital during the year is appended hereunder :

Case 1. *D.B.* : An old case of gross silico-tuberculosis, treated with apparent success at Wooroloo in 1953–54 with chemotherapy, who relapsed and was re-admitted to the Sanatorium in 1957 with a giant cavity in the right upper lobe. Sputum consistently positive on direct smear, but culture produces only atypical mycobacteria, completely resistant to all antibiotics. Regarded as infective. An attempt to close the cavity and render sputum negative by thoracoplasty was unsuccessful.

Case 2. *N.D.* : Middle-aged man who presented with progressive lassitude, cough and sputum. Serial X-rays over a twelve-monthly period showed deterioration and development of cavity in right upper lobe. Sputum positive on concentration. On culture grew atypical mycobacteria, insensitive to all antibiotics. Rest and therapy with three standard drugs failed to convert sputum, and resection of affected segments revealed macroscopic lesions characteristic of tuberculosis. Atypical acid fast bacilli were grown on culture from scrapings obtained from a cavity in the segment, and seen in stained histological sections prepared from the lesions, which showed the classical histological features of tuberculosis.

Case 3. *J.V.* : An old case of extensive tuberculosis, excreting typical mycobacteria tuberculosis, treated successfully at the Sanatorium during 1955–56, who failed to continue chemotherapy after discharge and suffered radiological relapse after twelve months. Sputum then positive on direct smear, but atypical acid fast organisms only were recovered on culture. Despite resistance to antibiotics in vitro, steady improvement in radiological appearances on continued chemotherapy, but sputum remains positive on culture for atypical organisms.

Case 4. *D.A.* : Elderly man with bilateral disease which progressed extensively in two years while under observation. Severe respiratory symptoms and sputum positive on direct smear, but the only organism ever isolated was atypical. Gradual progression of disease despite long-term chemotherapy. Patient finally died, and at autopsy typical tuberculous lesions found, in which atypical organisms demonstrated.

Case 5. *W.D.* : Middle aged man with previous normal X-rays, found to have lesion in right upper lobe on routine X-ray, which radiologically appeared as mixture of caseation, cavitation and fibrotic stranding. Sputum positive on concentration, but culture revealed atypical organisms, insensitive to all antibiotics, and no sign of conversion of sputum after six months treatment in hospital.

Case 6. *H.S.* : Routine X-ray revealed disease in right upper lobe. Symptoms suggestive of active disease and sputum positive on concentration. Culture showed atypical organisms which persisted after six months rest and chemotherapy. Thoracoplasty followed by complete conversion.

Case 7. *E.L.* : An elderly man with ankylosing spondylitis and evidence in serial X-rays over many years of fibrosis in both upper lobes. Sputum previously negative on culture recently grew atypical organisms unresponsive to antibiotic treatment. These organisms were regarded as secondary invaders of old damaged lungs associated with the anatomical deformity related to the patient's skeletal disease.

Case 8. *A.S.* : An old case of fibrosis of lungs associated with cystic disease and bronchiectasis. Atypical organisms recently discovered but regarded as secondary invaders, probably unrelated to the cause of the pulmonary pathology.

Case 9. *W.C.* : An old miner, with demonstrable silicosis of several years duration. Recent X-rays showed increased shadowing in right upper lobe which proved eventually to be anaplastic carcinoma. Atypical organisms consistently present in sputum, on concentration and culture, since admission to hospital ; regarded as of doubtful clinical significance.

Case 10. *G.B.* : A miner and asbestos worker with recent development of silicosis and superimposed tuberculosis, excreting typical mycobacteria tuberculosis, which were completely eradicated by adequate chemotherapy. While still on antituberculous drugs, sputum reverted to positive on concentration, but only atypical organisms recovered on culture. Clinical condition excellent, and organisms regarded as of highly doubtful significance.

The total number of cases admitted to hospital during the year in whom atypical organisms were recoverable was 19, and in only 7 of these was the organism regarded as being of major clinical significance as a causative agent of their disease.

Despite the fact that the organisms are insensitive, as evidenced by laboratory tests, a small number of these patients have benefited by Sanatorium regime and chemotherapy, with the conversion of their sputum. In others the sputum has remained consistently positive, and cavitated lesions have remained unchanged or actually deteriorated, despite complete rest with chemotherapy. In an effort to control the disease in these patients, surgical treatment has been instituted, two cases being subjected to segmental resection and one to thoracoplasty, the latter operation now being regarded as preferable, because of the dangers associated with resection without adequate antibiotic cover.

Surgery

The indications for the surgical management of typical tuberculosis remain markedly limited, because of the excellent results of medical treatment. Surgery has been reserved for those few cases in whom, after six months drug treatment, there was still evidence of active disease, particularly with cavitation, and for the cases excreting atypical mycobacteria in whom the sputum remained positive and cavitation remained obvious. Many of the patients subjected to surgery for typical tuberculosis had old disease which had been treated in the past with inadequate combinations of drugs, with the resultant development of resistant organisms. The details of surgical treatment of tuberculous patients are as follows :—

Segmental Resections	5
Lobectomies	4
Thoracoplasties (Staged)	9
Removal of Plombage and Drainage of Extrapleural Space	3

We are indebted to Mr. F. J. Clark, our senior thoracic surgeon, and to Messrs, J. A. Simpson and P. Gibson, who have attended regular weekly conferences at which all cases of surgical interest have been considered and discussed, and who have given most valuable service, both in a consultant capacity and in the surgical treatment of all patients. To them and to their anaesthetists, Dr. G. R. Troup, Dr. D. R. C. Wilson and Dr. H. R. Cohen, we are most grateful.

CONSULTANTS

Other consultants who have helped materially in dealing with problems associated with their particular specialties, are Mr. H. M. Hill, orthopoedic surgeon, Dr. Adrian Lamb, ophthalmologist, Dr. T. Anthony, dermatologist, Dr. W. B. C. Gray, psychiatrist, Dr. A. G. Fisher, neurologist, Dr. A. G. Mathew, gynaecologist, and Mr. H. McComb, plastic surgeon, and to all these consultants we arc sincerely grateful.

LABORATORIES

The Public Health Laboratories, obliged to vacate the quarters they had occupied for the past 10 years at Royal Perth Hospital, transferred to our laboratory early in the year. The space available proved grossly inadequate, and major structural alterations were necessary to make their accommodation more comfortable, but despite the difficulties encountered in moving in, they settled into their new home and have provided an excellent laboratory service, not only in special and general bacteriology, but also in haematology and biochemistry, and we are grateful to Dr. W. Laurie, the Director, and to Dr. N. Kovacs, the bacteriologist, for their ready help and advice in a multitude of problems.

In the investigation of suspected cases of tuberculosis, a survey was conducted throughout the year, to determine the comparative value of the investigation of sputum, gastric contents and bronchial washings. Although the series observed so far is too small to be statistically accurate, it is apparent that in any case in which there is suitable sputum for examination, this is the most likely source of organisms, but in the absence of sputum an adequate irrigation of the bronchial tree would seem to be preferable to the collection of fasting gastric contents in obtaining material for culture for tubercle bacilli.

Sensitivity tests have been carried out as a routine on the organisms recovered from all new patients, and in those few patients in whom sputum remained positive at the end of three months, the tests have been repeated to act as a guide in the continuation of antituberculous treatment.

X-RAY

The X-ray Department, under Mr. I. Lansdown, has worked efficiently, often under considerable difficulties because of changing staff. With 200 patients under treatment, the demands on the X-ray Department have frequently been excessive, and we are grateful to the staff for their cheerful co-operation at all times.

DENTAL SERVICE

Through the courtesy of the Outstations Section of Perth Dental Hospital, Mr. K. Wren attended the hospital one day per week, to provide urgent dental attention, and to maintain satisfactory oral hygiene of all tuberculous patients and more particularly those patients in whom thoracic surgery was contemplated. Our thanks are due to the Dental Hospital, and to Mr. Wren in particular, for the excellence of his service.

NURSING SERVICE

Under Matron O. Anstey an excellent standard of nursing has been maintained. Considerable thought has been given to staff establishment, and with the appointment of supervising sisters, it has been possible to reduce the number of staff, both trained and untrained, at all times of the day. I am most grateful to Miss Anstey and all members of her staff for their co-operation and conscientious discharge of their duties. The standard of teaching in the training school is of an excellent order, and it is gratifying to note that a substantial proportion of the staff establishment has been provided by Tuberculosis Trainees through the school.

A copy of Matron's report on the nursing staff activities during the year is forwarded as an appendix to this report, for your interest and information.

PHYSIOTHERAPY

Of inestimable value in the care of surgical patients, both pre- and post-operatively, the Physiotherapy Department has also assisted greatly in the treatment of chronic non-tuberculous conditions. During the past three months the value of this service has been most obvious. The adequate management of bronchiectasis and chronic bronchitis and emphysema is dependent on an efficient physiotherapy service, and we have been singularly fortunate in having a conscientious and efficient team in Miss M. Parry and her assistant Miss A. Sands, to carry out this service.

The hospital has played its part in the physiotherapy training programme, by providing tuition and practical work in the wards, for students in their final year of the course.

SOCIAL SERVICES

In addition to her official capacity as medical social worker, Miss G. Paddon acts as admitting officer, and so interviews all patients on admission, thus obtaining early information regarding patients' social problems, and at the same time providing a most excellent reception agency, which does much to promote ideal initial relations with the patients. Following her introductory interview, each patient's social progress may be more easily followed, and this department provides conscientious and efficient service to many patients with a constant variety of problems demanding solution. Her activities include enquiries regarding financial assistance, particularly related to the Tuberculosis Allowance, Invalid Pension, Mine Workers' Relief and pension claims ; domestic problems including help for affected mothers with families ; travel arrangements and accommodation ; native welfare, and a multitude of general enquiries and personal services.

REHABILITATION

An excellent liaison has been maintained with the rehabilitation section of the Social Services Department, and all patients for whom an alteration of occupation is considered necessary, are referred to the rehabilitation officer of that department through the medical social worker. With the early diagnosis of tuberculosis, consequent on mass radiography, and the adequacy of modern drug treatment, the number of patients requiring this service has been reduced to a very minimum, as in the majority of patients receiving treatment it may be anticipated that return to previous occupations will be possible within a short time of discharge, and the major problem facing us in the rehabilitation of patients is the present employment situation.

Many patients on discharge were referred through the Tuberculosis Physician, to the sheltered workshop conducted by the Tuberculosis Association, for graduated work for two or three months to prepare them for return to full-time activity in the general labour market. This workshop continues to offer an excellent medium for increasing " work tolerance," and we are indebted to the Association for their help in this direction.

OCCUPATIONAL THERAPY

With a staff of two qualified occupational therapists and one trained handcraft worker, this department has provided a diversity of avenues for the occupation of patients and done much to help maintain patient morale. Miss Adam, the senior occupational therapist, was granted compassionate leave for eight months, and in her absence the department was in charge of Miss Jill Nelson.

Art therapy has been continued under the supervision and enthusiastic stimulus of Mr. Guy Grey-Smith, who again has done much to assist patients, both in the provision of a variety of prints for hanging in the wards, and also in instruction and encouragement of the artistic efforts of individual patients.

CHAPLAIN SERVICE

The two major denominations, the Anglican and the Roman Catholic orders, have rendered invaluable help to many patients under various circumstances. Always on call for emergencies of any nature, the chaplains have conducted regular weekly services at the hospital on Sundays and weekdays, and administered Communion in bed to those who were too ill to attend the services.

In a hospital of this nature, concerned with long-term patients, there is no doubt of the value of the moral and spiritual support derived from an understanding and conscientious chaplain, and it is felt that this contribution to the welfare of our patients must be encouraged, and the goodwill of the Churches, who supply chaplains, cultivated in a practical manner, by as liberal financial support as we can provide.

ADMINISTRATIVE STAFF

The secretary, Mr. A. F. T. Thomson, and his clerical staff have maintained a high standard of efficiency, and I am most grateful to them for their co-operation and assistance at all times.

CATERING

In any hospital treating chronic illness, a major problem in maintaining the morale and peace of mind of patients is always in the provision of meals which retain their attraction, and in this regard we are most fortunate in having a catering service under the Catering Officer Mr. J. Pledge, which has provided an excellent variety of good food, well cooked and well presented, resulting in almost complete satisfaction, both from patients, and from staff.

HOUSEKEEPING

The hospital has only been in operation 18 months, and it is to be expected therefore that it should have retained a large part of its attractive appearance, but as a result of the conscientious supervision of the housekeeper, the general appearance of the walls and floors may, if anything, be said to have improved during the period of occupation, and its appearance is a tribute to the efficiency of the housekeeper and her staff.

ENGINEERING

With a small, but industrious and efficient maintenance staff working under him, the engineer has given excellent service in attending to the general maintenance of plant and to the multitude of minor repairs and adjustments inevitable in the early stages of the function of such an institution, and we are deeply indebted to Mr. Gordon for his readiness at all times to help us in any difficulties.

GROUNDS AND GARDENS

As with the interior of the hospital, the grounds and gardens have rapidly achieved an attractiveness, which is a tribute to the industry and enthusiasm of the garden staff. With the growth of trees in the grounds, it is hoped that in the near future these grounds will assume the character expected of the area surrounding such an institution.

VITAL STATISTICS

Admissions

The admissions throughout the year totalled 549, including 342 males and 207 females. Of the total, 411 were regarded as tuberculous or suspect tuberculous and investigated as such. The method of discovery and line of action which led to their admission to hospital are listed hereunder. Of the proven new cases of active tuberculosis, there were 38 "migrants," of whom 18 had been in the country for over 12 years, and of the remaining 20 more recent arrivals, 16 were from countries outside the British Commonwealth, 3 were from the United Kingdom and 1 was from within the Commonwealth. Of the tuberculous or suspect tuberculous cases there were 29 males with a mining history, and of these 9 were active positive cases and 20 were cases of silicosis with suspected but unproven tuberculosis superimposed.

Mode of Admission

Mass Radiography—Metropolitan	38
Country	20
Metropolitan Practitioners—Via Chest Clinics (Perth and Fremantle)	78
Via other diagnostic channels	7
Country Practitioners via the Chest Clinic	78
Royal Perth Hospital	31
Other Institutions	20
Chest Clinics (Routine)—Perth	88
Fremantle	11
Kalgoorlie	40

Re-admissions

Fifty-seven patients were admitted who had previously been treated for tuberculosis, at Wooroloo or other institutions, and were therefore regarded as "re-admissions." Of these, 22 had completely inactive disease and were admitted for treatment of intercurrent infections ; and 13, admitted for assessment, were also found to be completely negative to all bacteriological tests. Three cases, previously strongly positive for tubercle bacilli were admitted because of the discovery of atypical mycobacteria, and 19 patients were admitted with active disease due to typical tubercle bacilli. Of these 5 had never previously been treated with chemotherapy, and 14 had had varying courses of the three standard antituberculous drugs. The organisms of 7 of the latter were still drug-sensitive, while the organisms in the remaining 7 patients were resistant to Streptomycin, P.A.S. and Isoniazid. In only one of these patients was the previous course of chemotherapy considered adequate by our modern standards.

Resistant organisms have shown themselves to be a major problem in treatment. Notwithstanding the moderate degree of disease present in lungs, if drug resistance has occurred, treatment is useless to convert the sputum or heal the disease. The total number of cases harbouring resistant organisms who received treatment in the hospital during the year, including the "re-admissions" listed, was 13, and in only one of these was conversion of sputum achieved.

Discharges

There was a total of 485 discharges, in whom the final diagnosis was as follows :—

Active Pulmonary Tuberculosis	115
Sputum Negative Pulmonary Tuberculosis (regarded as active)	30
Pulmonary Tuberculosis (Sputum Negative, for assessment and necessary treatment)	74
Extrapulmonary Tuberculosis	17
"Atypical" Tuberculosis	9
Silicosis (Tuberculosis suspected but unproven)	23
Pneumonia and lung abscess	80
Bronchiectasis	19
Pleural Effusion (Probably Non-Tuberculous)	7
Bronchogenic Carcinoma	32
Bronchitis, Emphysema, Pulmonary Cysts and Asthma	30
Sarcoidosis	8
Pulmonary Oedema (Cardiac Failure)	7
Spontaneous Pneumothorax	4
Miscellaneous	21

One hundred and seventy-one patients were treated with long-term sanatorium regime and for these cases the average duration of stay was 28 weeks. There were only two irregular discharges, in one of whom the diagnosis of tuberculosis was unproven when he left hospital, and all sputum cultures subsequently proved negative, and the other case had just converted her sputum, after six months in-patient treatment. One patient only was discharged with sputum positive for Mycobacteria Tuberculosis.

DEATHS

Of the 15 deaths during the year, none was directly due to tuberculosis. Five patients had been treated for tuberculosis, but of these two died of cerebral vascular accidents secondary to atherosclerosis, one of carcinoma of the stomach, one of Staphylococcal septicaemia complicating aplastic anaemia, and one of carcinoma of lung with cerebral metastases. Of the remaining 10 cases, death was due to carcinoma in five, post-operative emypema and staphylococcal pneumonia in one, right heart failure (? due to gross pulmonary fibrosis) in two, and acute heart failure (? due to myocarditis) in the remaining two. Thus in the 16 months since the opening of the hospital, tuberculosis has been responsible for only one death.

In concluding my report it is difficult to express the depth of my gratitude to my assistant superintendent Dr. J. T. Smyth, for his loyal support and invaluable assistance throughout the year. To my other medical officers I record my appreciation for their loyalty and service, and to the medical officers of the Chest Clinic who have visited the hospital regularly to follow their own cases and take part in surgical conferences, I express thanks for their continued help.

Finally I wish to thank you Sir for all your interest, sympathy and guidance throughout the year. To the Commissioner of Public Health and the Under Secretary and their staffs we are indeed grateful for their continued interest and help. The hospital continues to function efficiently and to provide an excellent service to the community in the treatment both of tuberculous diseases and in the investigation and management of non-tuberculous conditions, and it is with a deep sense of pride in its achievements and appreciation of the efforts of all sections of its staff that I conclude this report.

H. R. ELPHICK, M.B.B.S., M.R.C.P., M.R.A.C.P.,
Physician Superintendent.

Appendix VI

Dr. H. R. Elphick,
Physician Superintendent,
Perth Chest Hospital.

I have the honour to present a report on the Nursing Administration of the Perth Chest Hospital for the year 1959.

It has been an extremely busy year, but a very satisfying one. The remaining three wards of 27 beds each were opened in January, March and June respectively.

NURSING STAFF

The number of Nursing Staff at the 1st January, 1959, was 103, and 123 at the 31st December, 1959. An analysis of the Nursing Staff is attached, including new appointments, resignations and wastage, also attendances at the Staff Health Clinic.

Sister Prior, Supervising Sister, was abroad for eight months of this year, six months being long service leave, and two months extra study leave on half pay. During this time Sister Prior visited Specialist Hospitals and Tuberculosis Hospitals in England studying the latest trends in Nursing. The knowledge gained by her has been of great value to this Hospital.

Sister Hewson and Sister Whitfield joined the Staff as Supervising Sisters, bringing with them many years of experience in the nursing profession.

WORK SIMPLIFICATION PROGRAMME

A four day programme conducted by J. P. Young and Associates was carried out. On the Nursing side the Deputy Matron and the Supervising Sisters attended. A full assessment of the value of this Course is not possible at the moment, as programmes now being carried out will test the benefit of this Course.

COLOMBO PLAN STUDENTS

Four students from Sarawak came to this Hospital in June to take a six months Post-Graduate Tuberculosis Course, and sat for the State Examination. All passed, three obtaining Credits. They fitted very well into the Hospital and from a Questionnaire filled in by them they were very happy with the programme and felt that the knowledge gained will help their country in the fight against tuberculosis. These were the first Colombo Plan Students to come to this Hospital, but since then three more have been accepted from Sarawak and we have received enquiries regarding Indian Students who wish to further their studies in tuberculosis.

EXAMINATIONS

First Professional—

Number entered for Examination	16
Number passed	14

Post-Graduate Students—

Number entered for Nurses' Registration Board Final Tuberculosis Examination	22
Number passed	21

(11 with Credit)

The wastage in the first year among Student Nurses is high, but in the Second Year remains satisfactory.

I would like to take this opportunity to thank Dr. King for his support during this year, Dr. Elphick and all the Medical Officers for the keen interest in the Nursing Staff.

On the Nursing side I would like to thank Miss P. Lee, the Principal Matron, for her guidance, Deputy Matron, Miss E. Moore, and all Nursing Staff for their loyal support in helping to establish a good nursing pattern in such a short period.

OLIVE E. ANSTEY,
Matron.

STAFF ESTABLISHMENT—PERTH CHEST HOSPITAL

January-December, 1959

	1st January	31st December	New Appointments and Promotions, 1st January to 31st December	Resignations, 1st January to 31st December
Administrative Staff, including Matron	5	7	2	*Nil*
Tutorial Staff	2	3	1	1
Ward and Departmental Sisters	13	23	13	6
Staff Nurses, General Trained	6	9	19	19
Staff Nurses, T.B. Trained	5	3	3	6
Staff Nurses, Post Graduate	17	8	26	19
Second Year Students	9	17	14	4
First Year Students	31	35	51	30
Trained Nursing Aides	12	13	18	18
Lay Staff	3	6	3	3
	103	123	150	106

ANALYSIS OF STUDENT INTAKE

	Two Year Students	Post Graduate Students
Number of intakes	4	3
Total number of Students in four intakes	51	27
Wastage from intakes as at December, 1959	19 (37·2%)	6 (22·2%)
Causes of Wastage—		
(a) Educational	8	
(b) Failed to complete P.T.S.	2	
(c) Marriage	3	
(d) All other causes	6	

STAFF HEALTH CLINIC

	Attendances
Nursing Staff	1,279
Food Production	261
Domestic Staff	197
Public Health Laboratories	148
Office Staff	145
Maintenance and Orderly Staff	117
Total attendance	2,147

Appendix VII

REPORT OF THE PHYSICIAN, PULMONARY FUNCTION LABORATORY

The Director,
Tuberculosis Control Branch,
Chest Clinic,
17 Murray Street,
Perth.

Sir, I have the honour to make a report on the Pulmonary Function Laboratory herewith as follows.

Prior to the middle of the 19th century, the practise of medicine rested almost exclusively on a body of empirical knowledge accumulated over the preceding two thousand years. During the 17th century the work of the anatomists and chemists began to exert an influence on the medical art, but it was not until the middle of the 19th century that the great figures in pathology and bacteriology inaugurated, in any real sense, the era of scientific medicine.

Half a century later the biochemist timidly advanced a claim to have a worthwhile contribution to make, and he has since established biochemistry as one of the basic medical sciences.

It is fair to say, however, that it is only during the last decade that the physiologist has achieved a position from which he can make an effective contribution to medical practice, as distinct from providing an educational background to the practising physician. Even at this present time, however, his major efforts are virtually confined to those diseases affecting the heart and lungs ; but in this limited sphere, as a result of the work of men whose names are now famous—Krogh, Cournand, Comroe and Riley, to mention only a few—the advances have been spectacular.

The fundamental contribution of the pioneers has been to construct a clear picture of each definable aspect of the function of the lungs and heart, and thus provide the missing functional link between pathological change and clinical syndrome. At the same time, in contrast to the earlier phases of other biological sciences, the quantitative description of functional status has been attempted right from the beginning.

This rapid advance has been due on the one hand to the coincidence in time of increased interest in this field, with the recent appreciation that there are mathematical techniques available with a wide application to the biological sciences, and on the other hand, to the nature of cardio-respiratory mechanisms which lend themselves in a unique manner to quantitative determination.

The objectives of the work in the respiratory laboratory are to provide information to the clinician by the efficient use of available techniques, enabling a more precise formulation of treatment, and in certain instances to assist in diagnosis. At the same time it is essential that there be a research programme with a view to broadening the applicability of these techniques, and it should also include some attempt at fundamental investigation.

It is our firm conviction that it is that portion of the laboratory's work devoted to investigation, which provides the stimulus to maintain the clinical work above the level of efficiency, below which it is not only less useful, but can be dangerously misleading.

An important off-shoot of the laboratory's clinical work is to provide assistance in the assessment of pulmonary disability, more particularly in miners. It is now fairly generally accepted that the X-ray appearance of the chest in miners exposed to silica dust can determine with reasonable accuracy the presence or absence of silicosis but may have little relation in the individual case to the degree of disability. It is not very uncommon to find fairly gross X-ray evidence of silicosis without significant disablement. The converse with minor radiological signs and symptoms of disproportionate severity is also encountered.

This situation is due to the fact that the commonest reason for disablement in silicosis is chronic bronchitis with or without an asthmatic element. A chest X-ray in the presence of silicosis will in most instances show little if any evidence of these associated conditions. However, the available techniques in the laboratory are ideally suited to determine their presence and degree of severity.

A further possible cause of disablement in affected miners is a defect in the capacity of their lungs to effect a normal exchange of respiratory gases. This also can be determined in the laboratory but it is our opinion that this type of functional defect is not an important cause of disability in West Australian gold miners.

A third and more remote cause of disability is due to increased rigidity of the lung resulting in a greater physical effort to produce a given respiratory volume per minute.

These various functional defects result in an increased load on the heart and the ultimate result in severe cases can be death due to right heart failure.

The present system of estimating disability as a percentage gives a seeming precision to clinical opinion which is entirely false. When such an estimate is based on laboratory findings, its pretension to accuracy has greater substance but a more rational classification would be as follows :—

Class A—Fit for work, including heavy work (*i.e.*, no disability).
Class B—Fit for light work only.
Class C—Fit for sedentery work only.
Class D—Unfit for work (*i.e.*, total economic incapacity).

If it is necessary to adhere to a percentage classification the above four classes could be regarded as representing steps of 25 per cent. work capacity. Class A would then be 100 per cent. and Class D 25 per cent., the latter indicating 100 per cent. disability in terms of earning capacity.

Since the inception of this laboratory as a fully operational unit in October last, a considerable volume of work and development has taken place. The clinical assessments being routinely done are :—

ERRATA

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The following formula should be substituted :—

Where $$X = \frac{t}{\left(\frac{1}{D_M} + \frac{1}{KV_c\,(C_s - C_E)}\right)MV_c}$$

then $$P_E = P_A - (P_A - P_V)\,e^{-X}$$

1. *Ventilatory Measurements*

These include at present only measurements of the vital capacity and forced expiratory volume both before and after the use of Aerosol Adrenaline administered under positive pressure. The measurement of the maximum breathing capacity, previously a routine procedure, has now been abandoned, having been found to be much less reliable than the forced expiratory volume, as well as being time consuming and very fatiguing for weakened or infirm patients. The vital capacity and forced expiratory volume measurements taken together are the basis of functional assessment, and most other functional defects can be related to a definite pattern of change in the ventilatory measurements.

2. *Gas Exchange*

The quantitative assessment of gas exchange is usually expressed in the form of the diffusion capacity. This procedure is particularly applicable in the fibrotic lung diseases such as Hamman-Rich syndrome, sarcoid and the pneumoconioses. At the present time there is both difficulty and confusion in the exact interpretation of the figure referred to as the diffusion capacity which, however, remains a useful measurement clinically, even if it is not quite what it purports to be. This will be referred to again.

3. Several bronchospirometries have been carried out, not, however, with complete satisfaction in all cases. But as from now, with the attainment of greater proficiency in gas analysis, this situation should improve.

The figures relating to routine investigations as from 1st October, 1959, are as follows :—

Ventilatory Estimations	221
Estimations of Diffusion Capacity	51
B.M.R. Estimations	5
Exercise Oxygen Uptake	5

Very shortly, in addition to the above, estimations of blood carbon dioxide tensions should be a ine procedure.

The major research activity has been in connection with the theoretical investigation of the quan- ive relationships concerned in gas exchange. The following equation has been arrived at :—

$$P_E = P_A - (P_A - P_V)\, e^{-\dfrac{t}{\left(\dfrac{I}{D_M} + \dfrac{1}{KV_c(C_s - C_E)}\right) MV_c}}$$

ch purports to describe the change in oxygen partial pressure of the alveolar capillary blood as it pro- sses along the capillary.

P_E = equilibrium O_2 pressure in capillary corresponding to saturation.

P_A = alveolar O_2 partial pressure.

P_V = venous O_2 partial pressure.

t = time spent in the capillary of the blood at the point in question.

D_M = membrane diffusion capacity.

$KVc\ (C_s - C_E)$ = the instantaneous rate of combination of oxygen with haemoglobin at the point per unit partial pressure of O_2.

M = the differential rate of change of the blood oxygen content with reference to the corresponding equilibrium pressure.

V_c = the capillary blood volume.

If certain conditions hold, this equation simplifies to an elementary type with important possibilities for simplifying and clarifying gas exchange estimation techniques.

A certain amount of work has been done on the nature of the curve recorded during a forced expiration. An interesting observation was made that it appeared to be a curve of a simple mathematical type, an exponential curve, with an abrupt transformation halfway through the expiration, which suggested a sudden change in physiological mechanism at a critical point. There has not as yet been opportunity to follow this matter up.

Lately, in addition to routine work, a number of healthy persons have been tested on the spirometer, with a view to checking normal standards.

I would like to place on record my appreciation of the unfailing help always available from Dr. Elphick, Matron Anstey, and the medical, nursing and lay staffs of the Perth Chest Hospital. I wish also to mention my assistant, Mrs. Beatrice Tweed, whose cheerful readiness to meet a situation, and skill in acquiring new techniques, have been a major reason for whatever work has been successfully accomplished. In conclusion Sir, I must thank you for your continued support and encouragement.

F. E. HEYMANSON,
Physician.

Appendix VIII

ADDENDUM

INDUSTRIAL CHEST DISEASE I.—EASTERN GOLDFIELDS

This report is concerned, mainly, with the results of the periodical examination of miners and ex-miners. Many more miners have voluntarily submitted themselves for a clinical examination, in addition to those who are under special supervision. Visits were made to Wittenoom and Norseman to examine workers clinically, in association with the Mines Mobile X-ray Unit.

The result of the examinations during 1959 are as follows :—

Total number of Chest X-ray examinations	7,269
Total number of cases of Silicosis	569
Total number of new cases of Silicosis	71
Total number of cases of Active Pulmonary Tuberculosis	10

The figures below are the results of the periodical examinations since their inception in 1925–26 to 1958. It should be borne in mind that not all miners are X-rayed annually, so that yearly totals are not an accurate reflection of the incidence of lung disease in any one year.

Table II

RESULTS OF PERIODICAL MEDICAL EXAMINATIONS OF MINE WORKERS FROM INCEPTION OF EXAMINATION (1925) TO 31st DECEMBER, 1958

Year	Total number of examinations	Total number of silicosis cases diagnosed	New cases of silicosis (previously normal or linear markings only)	Silico-tuberculosis and Tuberculosis without Silicosis
1925–26	4,023	642	642	142
1927	3,728	474	41	138
1928	3,483	460	62	46
1929	2,588	420	102	48
1930	3,399	450	138	164
1931	3,012	399	94	83
1932	4,285	426	35	24
1933	3,377	439	58	18
1934	5,563	406	55	17
1935	4,808	364	35	7
1936	7,363	372	30	19
1937	7,852	352	15	13
1938	7,141	296	13	12
1939	6,975	292	18	13
1940	7,299	268	12	8
1941	7,141	294	32	7
1942	5,824	350	61	5
1943	4,298	367	63	9
1944	4,468	375	70	14
1945	3,334	256	54	7
1946	5,606	300	90	12
1947	6,450	396	101	33
1948	5,134	298	24	9
1949	5,489	314	24	12
1950	6,203	349	14	12
1951	5,721	305	13	12
1952	5,959	294	9	12
1953	5,312	356	80	3
1954	6,179	487	158	16
1955	5,506	497	70	5
1956	5,476	474	30	9
1957	4,811	483	34	10
1958	6,286	582	54	8
	174,093	12,837	2,331	947

These results are disappointing and it would appear that there has been little significant improvement in the incidence of industrial chest disease for many years, despite the great advances in medicine, engineering, ventilation and working conditions. The totals only refer to miners and ex-miners examined under the Mine Workers' Relief Act and some examined for re-admission certificates under the Mines Regulation Act. They do not, therefore, contain all the cases of silicosis and/or tuberculosis attributable to the mining industry. Although 10 new cases of active pulmonary tuberculosis are recorded as being diagnosed in 1959, there were actually 24 cases, if men who have left the industry and were outside the scope of the relevant Mining Acts are included. Some cases may also have been diagnosed elsewhere and not brought to our notice.

It is hoped that the intensive follow-up and investigation of miners with abnormal chest X-rays will reduce the incidence of tuberculosis soon. This is a pious wish which has probably been repeated annually since 1926. It would appear that one worker out of every 60 who entered the industry contracted pulmonary tuberculosis and even today the annual incidence is 2 per 1,000. Fortunately, with the modern treatments available, even in the presence of advanced silicosis, successful treatment of the tuberculosis is almost guaranteed.

In regard to silicosis, the function of the periodical examination of workers, as conducted here, is mainly diagnostic, prevention being regarded as an engineering problem. One worker in every 30 who entered the industry developed silicosis with an annual incidence of 10 per thousand. It is not possible to determine what percentage of silicotics, recorded, subsequently appear in the last column as having developed tuberculosis. A frequent criticism made to account for the variation in the number of new cases of silicosis diagnosed annually and the continued high rate is that the diagnostic criteria vary. There is some truth in this criticism. With minimal radiological silicosis a subjective error is present but this usually only results in anticipating or delaying the diagnosis for a few years and the effect is cancelled out. Chest X-rays dating back to 1936 and clinical record cards containing the diagnoses made at the time are available and reappraisal of the films does not suggest that the diagnostic standards have varied greatly. Improved X-ray technique, high definition screens, dual film reading and comparison with standard films from the Pneumoconiosis Research Council are probably enabling a diagnosis to be made at a slightly earlier stage than hitherto and this is most desirable. If the diagnosis is in doubt, complete investigative facilities, including lung function tests, are available at the Perth Chest Hospital and ever increasing use is being made of these facilities.

Statistical analysis of the results is most difficult, if not impossible, because miners and ex-miners are examined under several different Acts and because of the large number of itinerant and casual short-term workers in the industry. Australian Blue Asbestos at Wittenoom which has been in full production for a relatively short time presents a different problem and has been the subject of a special report.

A report on the health of miners would not be complete without introducing the question of the miners general susceptibility to respiratory infections, particularly chronic bronchitis. It is extremely difficult to apportion pulmonary disability between silicosis and chronic bronchitis. Chronic bronchitis almost invariably accompanies silicosis but occurs equally commonly without any evidence, whatever, of silicosis. It is a disease associated with heavy industry and air pollution of which silica dust forms only a part. Dust, fumes, artificial working conditions, lack of sunlight, changes in temperature and humidity, cigarettes, alcohol, all contribute. The system of ventilation, which at times direct a stream of cold air on a man perspiring from over exertion, may also contribute. At the pre-entry medical examination all applicants for initial medical certificates with evidence of bronchitis are excluded and miners who develop suggestive symptoms are strongly advised to leave the industry. Intensive research is being conducted in England into this particular problem and further developments will depend on the outcome.

INDUSTRIAL CHEST DISEASE II.—WITTENOOM

Periodical chest X-ray examination of workers in the Asbestos industry during 1959 disclosed no new cases of Asbestosis, although there are several men whose X-rays must be considered suspect. Those whose X-rays are considered suspicious of Asbestosis will be examined again in 1960.

The length of exposure of workers contracting Asbestosis or Silicosis is much shorter than comparably employed men in the gold-mining industry and the extent of disease is greater. The small numbers of workers and the extremely high labour turnover make this less obvious.

There are a number of puzzling and disquieting features. In several instances Asbestosis has been diagnosed in underground workers although the disease had been considered peculiar to the Mill. One member of the train crew underground, not usually a great dust risk, has what appears to be a mixture of silicosis, asbestosis and possibly tuberculosis. Another underground worker has what appears radiologically to be pure silicosis, but his sputum contains asbestos bodies.

The Mines Department has permitted me to inspect the results of their periodical dust counts. It is obvious that the new Mill is a great improvement on the old Mill and that conditions underground have also improved. It is too early to tell whether the new Mill will be responsible for fresh cases of industrial chest diseases or not.

The disquieting feature about the dust counts are two fold :—

(1) The rock mined is apparently highly silicious and therefore particularly dangerous. The dust counts are on a par with the figures for the gold mines. A higher standard should be set in view of the high silica content and the additional Asbestosis risk.

(2) The dust counts are of particles only ; the same instrument is used for detecting silica particles and asbestos fibres. The dangerous particle size in Silicosis is less than 5 microns ; in Asbestosis the dangerous fibre length is between 20 and 40 microns. The dust counts therefore are of little value unless they show the number of fibres per cc within that range. The Konimeter in use in this State is not regarded as an effective instrument for dust counting in the Asbestos industry in Canada. A midget-Impinger is used. It is stressed that fibres over 10 microns in length are of particular importance and whilst the total dust concentration should be below 10 million particles per cubic foot of air, the maximum fibre count (*i.e.*, over 10 microns in length) permitted, is 1 million fibres per cubic foot of air.

Many workers remain at Wittenoom for less than one year and less than 50 per cent. of the work force, at any one time, have been continuously employed for more than four years. A very rough estimate of the percentage of workers, with over four years exposure and suffering from industrial chest disease is 12 per cent. (estimated by expressing the number of workers, detailed below, as a percentage of the number of workers examined in 1959 whose initial mining certificate was issued prior to 1955).

In recent years it would be unusual to diagnose Silicosis in a gold miner with less than 10 years exposure. For example, in 1958 there were no new cases of Silicosis in the 0–10 year group, 20 cases in the 10–20 year group and 29 cases in the 20–30 year group. Expressed as a percentage of the total number of mine workers, this gives an annual incidence of Silicosis of approximately 1 per cent.percentage incidences These are notvery accurate and are not really comparable, but they do illustrate the grave hazard which existed at Wittenoom compared with the general mining industry.

Since 1958, there have been one underground and five mill workers at Wittenoom definitely diagnosed as suffering from Asbestosis. All were advised to leave the industry but for various reasons have not done so. Five of the six were investigated in hospital. The average exposure to asbestos dust in these cases was four years only.

There are two other suspect cases and two suggesting they are affected with a combination of Silicosis and Asbestosis.

Apart from these, four others were diagnosed with Silicosis, three having had a previous history of coal mining abroad. These cases suggest that there is also an increased risk of Silicosis underground at the mine. The average exposure in these cases is 11 years (excluding previous mining). In two of these cases there is probable superadded tuberculous infection.

Some newly diagnosed cases of Silicosis are not included because of previous lengthy gold-mining history which could reasonably be held responsible.

There have also been a few cases of workers developing pulmonary tuberculosis without Silicosis or Asbestosis, but their number does not suggest any particular hazard at Wittenoom, other than that associated with mining in general.

Three workers with a mixed gold and asbestos mining history have developed silicosis and asbestosis. Four workers with a similar mining history have developed pure silicosis. Of these seven workers, the average exposure to dust including all mining was 12 years and excluding previous mining (which is not entirely justifiable) was 7 years.

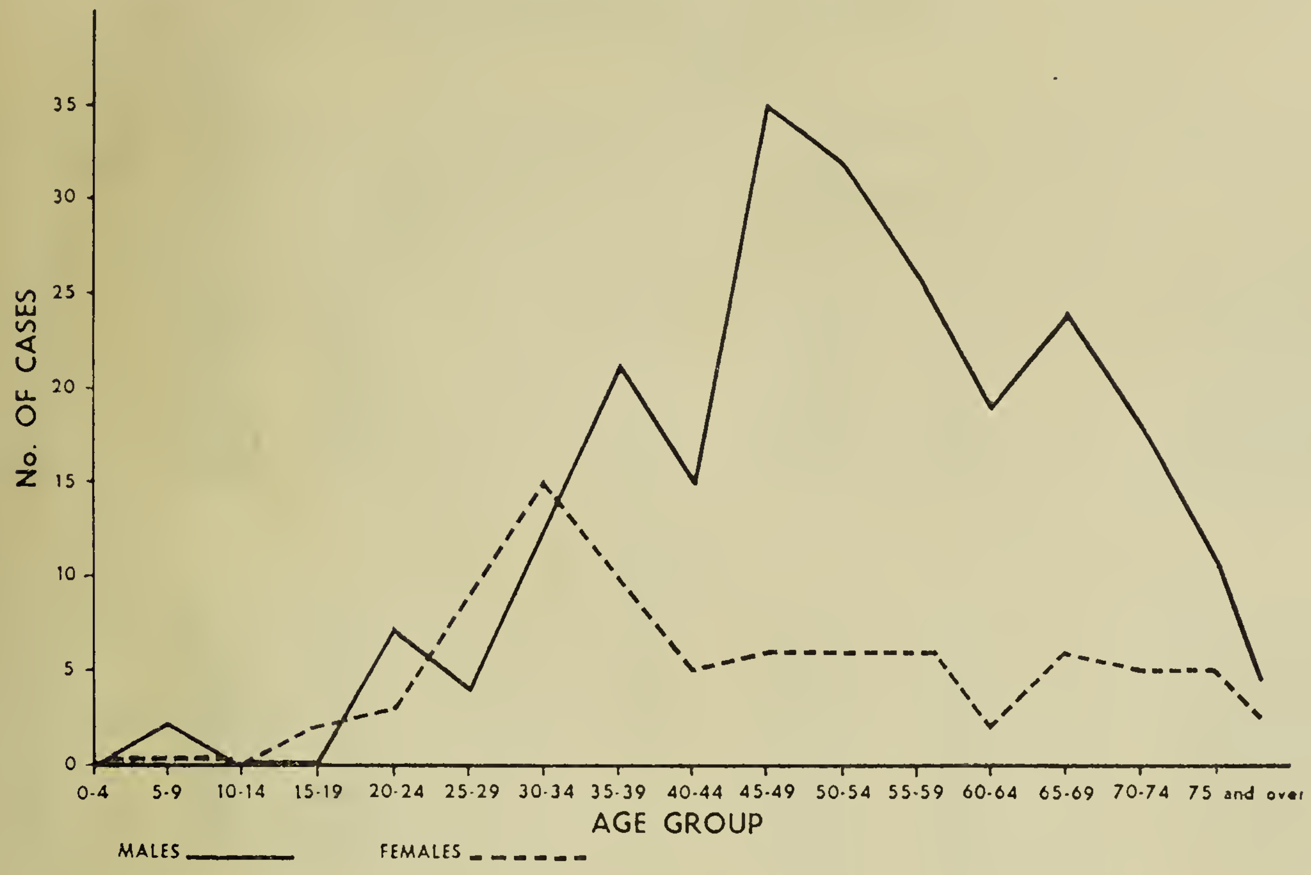
Conclusion

The percentages quoted above (*i.e.*, 12 per cent. of asbestos workers suffering from industrial chest disease with over 4 years exposure compared with 1 per cent. of gold miners with over 10 years exposure) are crude and probably paint too black a picture of the conditions which existed. With a shifting working population, it is almost impossible to work out accurate incidences. However, the very high labour turnover at Wittenoom is necessarily associated with a short average exposure per worker and many workers at risk were protected simply because their exposure time was too short. At least one of these short-term workers has been diagnosed as suffering from Asbestosis, many years after he left the industry.

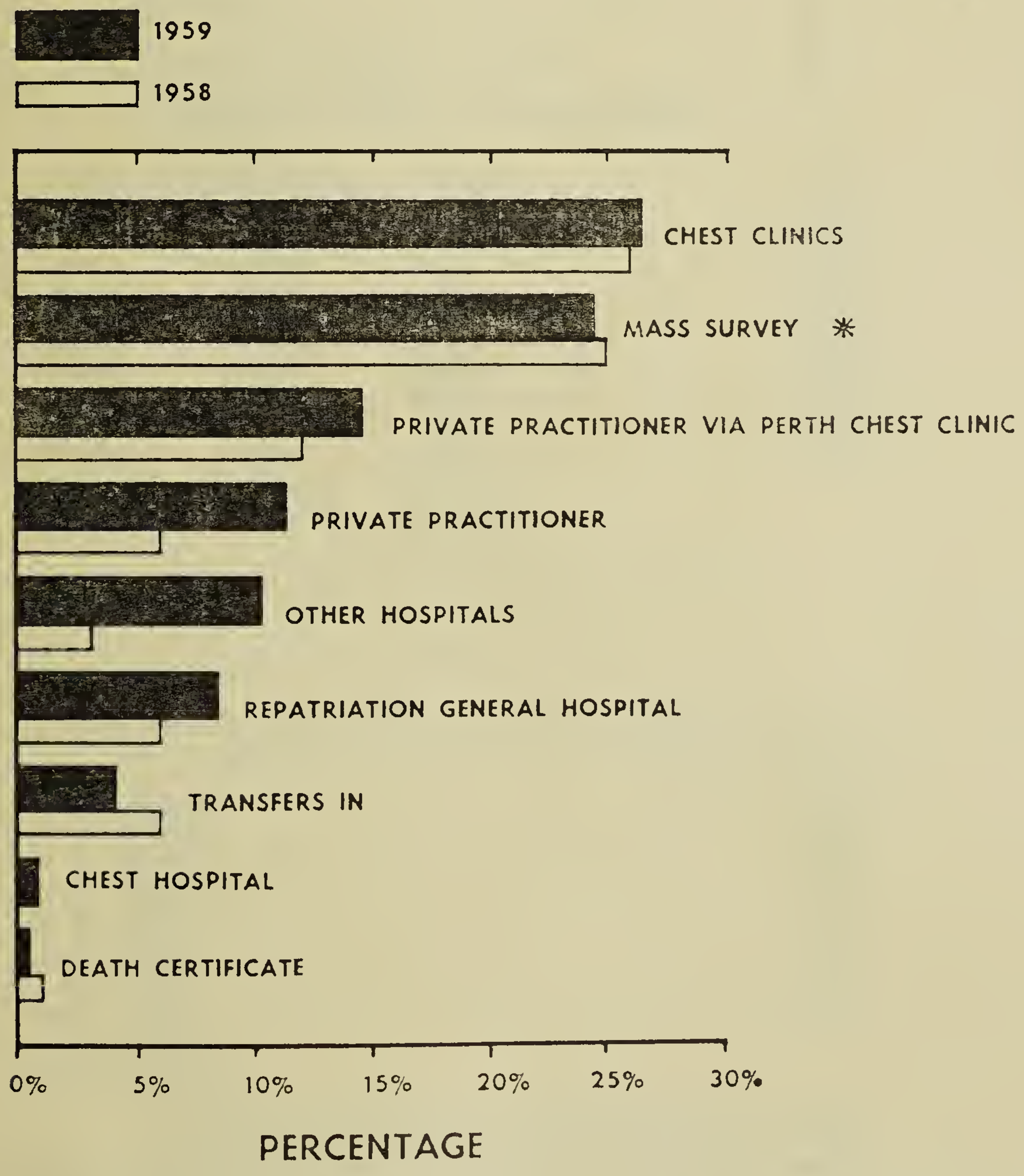
The problem is essentially one of ventilation conducted with a proper appreciation of the relative importance and medical significance of the asbestos fibre as distinct from the silica particle. Despite the many marked improvements which have been effected at the Mine and Mill, I am not satisfied that the risk of industrial chest disease has been eradicated or even brought to par with the risk of Silicosis in the gold-mining industry. The prevention of industrial chest disease is a medico-engineering problem and requires close liaison between the Mines Department, who are responsible for ventilation and dust counts, and the medical officers who are responsible for the periodical clinical and chest X-ray examinations.

J. McNULTY, M.B., Ch.B., B.A.O.,
Chest Physician.

GRAPH SHOWING AGE DISTRIBUTION OF PULMONARY TUBERCULOSIS NOTIFIED IN 1959



GRAPH SHOWING THE SOURCE OF NOTIFICATION OF CASES OF PULMONARY TUBERCULOSIS AS PERCENTAGE OF TOTAL NOTIFICATIONS



***NOTE**: Second compulsory mass X-ray survey ceased August, 1959

COMPULSORY MASS X-RAY SURVEYS

Metropolitan

Municipality or Road Board	First Survey				Second Survey			
	Date	Number Micros Taken	Number T.B.	Rate per 1000	Date	Number Micros Taken	Number T.B.	Rate per 1000
Perth Road Board	11·54	27,573	54	1·9	10·57	25,907	14	·5
Fremantle—City of	5·55	14,107	14	1·0	2·58	13,020	15	1·1
Nedlands Municipality	6·55	10,260	11	1·0	4·58	9,606	3	·3
Subiaco—City of	9·55	8,683	19	2·1	5·58	7,093	5	·7
Belmont Road Board	8·56	6,613	17	2·5	2·59	6,838	6	·9
Canning Road Board	9·56	6,195	10	1·6	3·59	6,824	8	1·1
South Perth—City of	1·57	13,353	13	·9	6·59	12,586	7	·5
Melville Road Board	6·56	10,115	9	·9	1·59	12,590	10	·8
Country								
Kalgoorlie Municipality	7·52	8,057	43	5·3	10·56	6,691	18	2·6
Boulder Municipality	8·52	3,030	20	6·6	11·56	2,633	9	3·4
Albany Municipality	12·52	6,239	16	2·5	3·58	6,688	4	·6
Geraldton Municipality	4·53	8,108	16	1·9	10·58	6,475	5	·7
Bunbury Municipality	10·53	6,500	14	2·1	1·58	7,122	4	·5
Manjimup Road Board	3·54	3,415	5	1·4	5·58	5,841	4	·6
Northam Municipality	6·54	4,497	....	....	2·59	4,990	3	·6
York Municipality	11·55	1,399	6	4·2	2·59	1,425	1	·7
Carnarvon Municipality	6·56	1,408	4	2·8	9·59	1,369	2	1·5

Note.—Compulsory age group—1/7/1952—16 years and under 75 years.
1/3/1954—16 years and over.
1/1/1959—18 years and over.

Western Australia

EXPENDITURE ON TUBERCULOSIS*†

Year	Capital	Maintenance	Totals
1949–50		207,940	207,940
1950–51	49,631	271,871	321,502
1951–52	48,830	308,198	357,028
1952–53	126,594	420,860	547,454
1953–54	123,665	454,861	578,526
1954–55	123,213	483,296	606,509
1955–56	278,424	509,673	788,097
1956–57	§ 446,180	572,431	1,018,611
1957–58	689,631	572,530	1,262,161
1958–59	256,532	633,620	890,152
	£2,142,700	£4,435,280	£6,577,980

§ Including cost of Perth Chest Hospital, £1,705,540.

NATIONAL WELFARE FUND—TUBERCULOSIS ALLOWANCE*‡

30/7/50 commencement	£	s.	d.
1950–51	107,008	11	5
1951–52	122,058	16	7
1952–53	116,589	5	0
1953–54	113,258	6	5
1954–55	105,857	1	2
1955–56	111,295	5	9
1956–57	91,544	13	6
1957–58	76,109	3	11
1958–59	78,084	4	9
	£921,795	8	6

* Does not include expenditure by Repatriation Commission.

† Figures supplied by Accountant, Public Health Department.

‡ Figures by courtesy Commonwealth Director of Social Services, W.A.

State of Western Australia

TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDED 31st DECEMBER, 1959

Showing Age, Sex, Form and Stage of Disease

Age Group	Males					Females					Persons					Total
	Pulmonary			N.P. T.B.	Pleural Effusion	Pulmonary			N.P. T.B.	Pleural Effusion	Pulmonary			N.P. T.B.	Pleural Effusion	
	Min.	Mod.	Adv.			Min.	Mod.	Adv.			Min.	Mod.	Adv.			
0– 4	....	....	....	2	....	....	....	....	4	....	....	....	....	6	....	6
5– 9	2	....	....	2	....	....	....	....	3	....	2	....	....	5	....	7
10–14	....	....	....	1	....	....	....	....	1	....	....	....	....	2	....	2
15–19	....	....	....	1	1	....	2	....	1	1	....	2	....	2	2	6
20–24	5	2	....	1	1	1	1	1	1	....	6	3	1	2	1	13
25–29	1	2	1	2	....	7	2	....	1	....	8	4	1	3	....	16
30–34	7	2	4	1	1	6	7	2	1	1	13	9	6	2	2	32
35–39	10	11	....	4	....	4	3	3	1	....	14	14	3	5	....	36
40–44	5	8	2	3	2	2	3	....	....	1	7	11	2	3	3	26
45–49	10	16	9	....	1	4	2	....	....	....	14	18	9	....	1	42
50–54	12	14	6	....	....	1	4	1	....	....	13	18	7	....	....	38
55–59	5	17	4	1	1	1	5	....	....	....	6	22	4	1	1	34
60–64	4	7	8	....	1	....	2	....	....	....	4	9	8	....	1	22
65–69	6	17	1	....	....	3	2	1	1	....	9	19	2	1	....	31
70–74	3	9	6	....	....	....	4	1	2	....	3	13	7	2	....	25
75–	2	6	3	....	....	2	2	1	....	....	4	8	4	....	....	16
N/S	....	1	1	....	....	....	....	....	....	....	....	1	1	....	....	2
Total	72	112	45	18	8	31	39	10	16	3	103	151	55	34	11	354

SOURCE OF REPORT

Source	No.
Mass Survey	87
Private Practitioners via Perth Chest Clinic	51
Private Practitioners	40
Repatriation Hospital	30
Other Hospitals	36
Transfers In	14
Chest Hospital	2
Chest Clinics	93
Post Mortem	1
Total	*354

* Includes Renotifications 27.

Appendix IX

Western Australia

PULMONARY TUBERCULOSIS

Year.	Population in 1,000s.	Notifications Received.	Incidence Rate per 100,000 Population.	Deaths Registered.	Mortality Rate per 100,000 Population.
1911	287	259	90·2	190	66·2
1912	301	429	142·5	220	73·1
1913	313	424	135·5	206	65·8
1914	323	353	109·3	229	70·9
1915	321	336	104·7	233	72·6
1916	313	511	163·5	225	71·9
1917	306	464	151·6	217	70·9
1918	308	432	140·5	245	79·5
1919	320	467	145·9	289	91·6
1920	330	442	133·9	259	78·4
1921	334	424	126·9	277	82·9
1922	341	387	113·8	256	75·1
1923	351	361	102·8	216	61·5
1924	363	381	104·6	228	62·8
1925	373	403	108·4	259	69·4
1926	381	415	108·2	252	66·1
1927	392	409	104·3	231	56·4
1928	408	395	96·8	282	69·1
1929	421	400	95·0	245	53·4
1930	429	569	132·6	218	50·8
1931	432	372	86·1	223	51·6
1932	435	339	77·9	203	46·7
1933	439	295	67·2	207	47·2
1934	442	287	64·9	218	49·3
1935	447	270	60·4	210	47·0
1936	452	338	74·8	193	42·7
1937	457	239	53·0	172	37·6
1938	464	247	53·2	177	38·1
1939	470	202	43·0	179	38·1
1940	473	231	48·8	181	38·3
1941	474	154	32·5	185	39·0
1942	477	113	23·7	175	36·7
1943	477	273	57·3	144	30·2
1944	481	219	45·4	134	27·9
1945	488	271	55·5	149	30·5
1946	493	343	69·6	163	33·1
1947	502	372	74·0	128	25·4
1948	515	325	63·1	157	30·5
1949	533	499	93·6	123	23·1
1950	558	586	104·8	129	23·1

DEATH CLASSIFICATIONS ACCORDING TO 6TH (1948) INTERNATIONAL LIST.

Year.	Population in 1,000s.	Notifications Received.	Incidence Rate per 100,000 Population.	Deaths Registered.	Mortality Rate per 100,000 Population.
1950	558	586	104·8	125	22·4
1951	580	467	80·4	76	13·1
1952	601	508	84·4	75	12·5
1953	621	378	60·6	43	6·9
1954	640	348	54·3	57	8·9
1955	659	413	62·7	31	4·7
1956	677	424	62·6	43	6·3
1957	692	332	47·9	36	5·2
1958	706	355	50·3	22	3·1
1959	726	320	44·1	24	3·3

Appendix X

REPORT BY THE DIRECTOR OF EPIDEMIOLOGY

During the greater part of the year 1959, I was absent from the State on an Overseas Study Tour made possible by a Travelling Fellowship awarded by the National Health and Medical Research Council. The observations arising out of this visit to Europe and America have now been published in the Medical Journal of Australia (April 16, 1960). Apart from numerous technical matters concerned with epidemiology, I specially investigated Maternal Mortality Control in Minnesota, the operation of Poison Control Centres in America, certain activities in the field of Health Education, and the teaching of Preventive Medicine to medical undergraduates. The information gleaned has been communicated to those involved, and steps have already been taken to apply this knowledge where indicated. I returned with the strong conviction that epidemiology within the Department should be reactivated and expanded if its potential value in public health was to be fully utilised. Appropriate proposals for re-organisation to meet this need have already been submitted. I gained the impression that Australian Salk vaccine was superior to that used elsewhere and that Western Australia's vaccination record was unequalled anywhere in the world. Attenuated oral poliomyelitis vaccines were well developed in America and Russia, but their adoption in Australia was neither likely nor necessary. The basis of future infant immunisation programmes was likely to be " quadruple antigen " (against diphtheria, whooping cough, tetanus and poliomyelitis) ; and routine use of this agent had already begun in Canada.

During my absence the Deputy Commissioner assumed responsibility for urgent epidemiological problems, with the aid of the Director of Laboratories. Among the more notable occurrences were an extensive epidemic of upper respiratory disease, an outbreak of mild diphtheria in an orphanage, and the occurrence of bacillary dysentery in a boarding school. The Senior Medical Officer of the Salk Vaccination Unit (Dr. B. Lewis) with the loyal co-operation of Mr. F. Skeels and all concerned, conducted the Salk vaccination programme with smoothness and efficiency.

Poliomyelitis Immunisation

The Poliomyelitis Immunisation Project entered its third year in 1959, with the Child Vaccination Phase completed and adult vaccinations in full progress. Great pains were taken during the year to make it as easy as possible for adults to receive protection. Evening or " after-work " clinics were regular features, while shopping centre locations were chosen for the convenience of housewives. Itineraries were publicised well in advance and general acceptance of the vaccine by adults was satisfactory. It is notable that many in the " over 40 " or less susceptible age group took advantage of the facilities provided. The four Mobile Units travelled 67,933 miles (mostly in the country) and a total of 309,914 separate injections of salk vaccine were administered. One caravan, which had been rendered unserviceable through prolonged country use, required replacement during the year.

Five cases of poliomyelitis were confirmed during 1959. All were paralytic. Two had never received any injections ; and of the remaining three, two had received only one injection, while the third had received his final dose of vaccine while already incubating the disease. Type III virus was isolated from this child.

Altogether, since July, 1956 (when Salk vaccination began) only 11 cases of poliomyelitis have been confirmed in the State ; eight of these had never been vaccinated, while the remaining three had not been completely vaccinated. This post-vaccination record is most remarkable and gratifying. The average incidence of about three cases a year since Salk vaccination began is the least since reliable records of the disease have been maintained in the State over a period of nearly 50 years.

It would seem that yet another dangerous infectious disease has now been conquered, but lest memories of the grim past grow too dim and minds become too complacent, it is well to remember that polio-virus is still present in the community, that Salk vaccination does not necessarily curtail its prevalence, and that the risk to the unvaccinated remains undiminished. If the control which has been achieved is to be maintained, then it is imperative that the Adult Campaign be pursued, and that the maximum immunisation of migrants and new infants be attained. Continuous immunisation facilities coupled with constant public awareness are the only effective safe-guards against the recurrence of an epidemic disease, the scars of which are still evident in many West Australian homes.

SALK VACCINATIONS (1st JANUARY, 1959 TO 31st DECEMBER, 1959)

Age Group	Third Injections	Second Injections	First Injections	Total Number of Separate Injections
Under 15	17,896	19,898	22,478	60,272
Over 15	82,826	80,581	86,235	249,642
All Ages	100,722	100,479	108,713	309,914

ANNUAL VACCINATIONS

Period—	Separate Injections Given
1st July, 1956, to 31st December, 1956	224,466
1st January, 1957, to 31st December, 1957	415,166
1st January, 1958, to 31st December, 1958	273,017
1st January, 1959, to 31st December, 1959	309,914
1st July, 1956, to 31st December, 1959	1,222,563

Owing to the fact that vaccinations have been spread over 3½ years and that children have therefore moved from one age group to another, it is not possible to give an accurate statement of the proportion immunised in specific age groups. All that can be said is that up to the end of 1959 no less than 1,222,563 separate injections of Salk vaccine were given, that nearly all the children in the State have had one or more injections, and that up to half of all adults have begun the course of vaccination.

POLIOMYELITIS INCIDENCE

(Since Salk Vaccination)

	July-December, 1956		1957		1958		1959		Total
	N.P.	P.	N.P.	P.	N.P.	P.	N.P.	P.	
Not Vaccinated	1	1	....	3	....	1	....	2	8
Vaccinated	....	....	....	....	....	....	....	2(1) 1(3)	3
Total	1	1	....	3	....	1	....	5	11

Home Injury Survey

During the year I was asked by representatives from the College of General Practitioners (W.A. Faculty) for suggestions concerning an epidemiological study which the College could undertake in preventive medicine. A study of upper respiratory tract disease was seriously considered, but was abandoned because of various practical difficulties. As an alternative, a group of these family doctors agreed to undertake a survey of home injuries necessitating medical attention. This appeared to be a useful sequel to the Corrigin experiment in home accident prevention which had been untertaken by the Health Education Council, and the latter body provided record cards for the study. Altogether, 22 general practitioners representing 11 practices (8 metropolitan and 3 country) agreed to collect specific information about all home injuries referred to them for treatment over a consecutive period of 12 months commencing 1st August, 1959. It was anticipated that some 600–800 injuries would be involved ; and it was hoped that the resulting accident pattern would highlight preventable factors which could be reduced by a subsequent educational programme. The results of this study will be analysed by the Department and the outcome is awaited with interest.

Residentships in Preventive Medicine

During the last month of the year four newly graduated doctors awaiting hospital appointments were employed as temporary resident medical officers within the Public Health Department. This was a novel step, but it is an experiment already tried with success in certain health departments overseas. It has several advantages. It stimulates the interest of young doctors in preventive medicine and could aid recruitment to health departments. Further, it contributes to a better understanding between clinicians and health administrators ; and finally, it enables selected public health tasks to be accomplished. The men concerned were used on Salk vaccination sessions for brief periods, and they helped with some serological studies on trachoma, but most of their time was spent on specific assignments in epidemiology. The following is a resume of their main activities :—

1. *Gamma Globulin Study*

The usage and results of gamma globulin prophylaxis were analysed from records maintained at the Commonwealth Health Department, and reports submitted by medical practitioners during 1958 ; and where required, personal follow-up enquiries were undertaken. This study disclosed that during a consecutive period of 12 months, 3,333 issues of gamma globulin were made for the following conditions :—

	%
(i) Rubella	75·9
(ii) Infective hepatitis	16·3
(iii) Measles	7·2
(iv) Agamma-globulinaemia	0·5
(v) Other conditions	0·1
Total	100·0

Of 1,554 notifications reporting the outcome of gamma globulin injections as a prophylactic against rubella in early pregnancy, 24 revealed that the patients subsequently developed rubella in spite of the injection. (But in only 12 of these did the rash develop within the range of 10–21 days after exposure ; and in all of these 5 ml. of gamma globulin had been given within five days of exposure to rubella.)

Of 138 follow-up reports for measles prophylaxis, 15 stated that despite 2 ml. of gamma globulin, the patient developed measles 5–15 days later. Twin boys (aged 19 months) were injected five days after exposure, and developed a mild form of the disease five days after this. In all the cases referred to, gamma globulin appears to have exerted a mitigating influence on the disease.

Two " reactions " were recorded. One woman developed " anaphylactic shock " within five minutes of injection ; while a second woman showed urticaris within 48 hours of her gamma globulin injection.

2. *Staphylococcal Study.*—The incidence and nature of staphylococcal disease treated within a metropolitan group practice over a period of six years (1954–1959) was studied from clinical records. During the period involved 797 staphylococcal lesions were recorded. The following abbreviated tabulations set out the main findings :—

TYPES OF LESIONS

	%
Abscesses	61·9
Furuncles	10·5
Infected lacerations, etc.	9·5
Pustules	6·0
Paronychia	3·3
Carbuncles	2·1
Styes	2·1
Miscellaneous conditions	3·6

SITES OF LESIONS

Upper limb	22·3
Head and neck	21·5
Lower limb	13·9
Trunk	8·5
Multiple areas	14·9
Not specified	18·9

PENICILLIN-RESISTANCE OF STRAINS EXAMINED

Year	Number of Strains Examined	Sensitive	Resistant
1954	58	32	26 (45%)
1955	196	93	103 (52%)
1956	189	108	81 (43%)
1957	119	71	48 (40%)
1958	93	26	67 (72%)
1959	106	44	62 (58%)
1954–1959	761	374	387 (50%)

The full report of this study has been submitted to Dr. John Watson of the College of General Practitioners.

As a supplement to this investigation, nasal swabs were taken from 129 boarders at a private school where the incidence of staphylococcal disease had greatly diminished. Of these swabs, 64 (49·5 per cent.) contained haemolytic coagulase-positive staphylococcus arueus, of which only 10·3 per cent. were resistant to penicillin.

3. *Homologous Serum Jaundice*

An investigation was made through the records of the two main metropolitan general hospitals over a 5-year period (1955–1959) in order to find out whether homologous serum jaundice had occurred in the State. Although it is a notifiable disease, no case has yet been reported to the Public Health Department. The clinical case notes of all patients with jaundice or hepatitis treated at these two hospitals were carefully scrutinised. Of 27 Fremantle Hospital patients with hepatitis or jaundice, there was only one with clear evidence of parenteral therapy within a period of six months prior to admission. This patient had received an injection of tetanus antitoxin five months prior to his hepatitis. Among the Royal Perth Hospital patients, one had had an intra-venous pyelogram six months previously ; and four had been given injections of various kinds. One of these had received regular insulin. In none of these were the circumstances suspicious of syringe-transmitted hepatitis. Evidence of the occurrence of homologous serum jaundice in Western Australia could therefore not be obtained.

4. *Typhoid at a Mental Hospital*

Sporadic typhoid has occurred at Claremont Mental Hospital off and on for several years, and it has always proved extremely difficult to identify the source of infection. During October, 1959, a patient spent a brief period of eight days in the hospital and developed typhoid fever about a fortnight after her discharge. The strain involved was 'phage type E1. It therefore seemed likely that she acquired her infection within the hospital, and an intensive investigation was undertaken in order to identify any unsuspected carriers in the institution. While in hospital she had been accommodated in a self-contained block with 88 beds. It was established that she had close and intimate contact with only 10 other patients. From these, faecal and blood samples were taken. All were negative. From the remaining 78 patients blood samples only were obtained. Four of these sera showed " Vi " agglutinins in minimal titres ; a fifth had a titre of 1 in 80. A few weeks later this latter patient developed fever. She had complained of vague upper abdominal symptons off and on in the past, and had been regarded as a probable cholecystitis. A blood culture was taken and salmonella typhi ('phage type E1) was isolated. Her illness was complicated by pneumonia and she died.

It was assumed that she had been a chronic typhoid carrier with associated cholecystitis and that she had succumbed to a systemic generalisation of the infection. It is likely that she was responsible for the original patient's infection.

Influenza Epidemic

A widespread epidemic of respiratory disease occurred in the State during the period March-June, 1959. The majority of the cases involved are believed to have suffered from influenza and there were a number of deaths, mainly among old people. Influenza virus (A/Asian) was isolated from seven patients and adeno-virus from one ; while 23 of 44 sera examined indicated previous exposure to A/Asian virus, and five to adeno-virus.

The opportunity was taken by Dr. W. S. Davidson to evaluate the efficacy of influenza virus vaccines previously used. He assembled data from 10,950 questionnaires involving 2,764 vaccinated and 8,186 non-vaccinated personnel ; and concluded that the two doses of polyvalent vaccine (incorporating Asian virus) followed by a refresher dose prior to the onset of the epidemic had conferred about " 35 per cent. protection " against respiratory disease.

His detailed report is being submitted to an appropriate journal for publication.

INFLUENZA DEATHS IN W.A.—1957-1959

(Rubrics 480–483 in State Statistical Register)

Month	1957	1958	1959
January	1	....	....
February	....	....	....
March	....	....	1
April	1	1	27
May	....	1	29
June	1	....	14
July	1	....	5
August	3	2	2
September	21	2	3
October	11	1	1
November	3	2	....
December	1	....	....
January-December	43	9	82

Age Group	1957	1958	1959
0– 4	4	1	3
5– 9	....	....	....
10–14	1	....	1
15–19	2	....	1
20–24	2	....	....
25–29	1	....	4
30–34	2	2	2
35–39	2	....	1
40–44	....	....	3
45–49	2	1	3
50–54	6	....	6
55–59	5	....	4
60–64	2	....	5
65–69	2	....	9
70–74	3	....	9
75–79	4	1	14
80–84	4	3	8
85–89	1	1	7
90 and over	....	....	2
All ages	43	9	82

PNEUMONIA DEATHS IN W.A.—1957-1959

(Rubrics 490–493 in State Statistical Register)

Month	1957	1958	1959
January	8	17	5
February	13	11	7
March	13	19	14
April	8	16	31
May	15	12	31
June	14	11	15
July	27	15	15
August	23	31	15
September	32	18	18
October	20	18	21
November	15	14	26
December	20	22	13
January-December	208	204	211

Age Group	1957	1958	1959
0– 4	36	48	31
5– 9	2	....	3
10–14	2	1	....
15–19	1	1	1
20–24	1	....	1
25–29	1	....	....
30–34	2	3	1
35–39	2	2	1
40–44	5	2	2
45–49	2	4	4
50–54	7	7	5
55–59	7	8	12
60–64	8	10	11
65–69	15	9	13
70–74	17	16	22
75–79	31	25	33
80–84	26	30	28
85–89	23	28	23
90 and over	20	10	20
All ages	208	204	211

Appendix XI

REPORT BY DR. F. DEBNEY OF THE VENEREAL DISEASES SECTION

There was a further fall in the total number of notifiable cases seen during the year.

The four early cases of syphilis had all contracted the infection in the Eastern States and two of these had not been treated before.

Penicillin remains the drug of choice for gonorrhoea. In three instances re-treatment was given, and in two of these the condition recurred following the second course of treatment, when it became necessary to resort to a different antibiotic.

Allergic reactions to penicillin are comparatively rare although one minor anaphylactic reaction was encountered.

Appendix XII

VENEREAL DISEASE IN WESTERN AUSTRALIA

Disease	Male		Female		Total	
	1958	1959	1958	1959	1958	1959
Syphilis—						
Primary	2	3	....	....	2	3
Secondary	....	....	....	2	....	2
Tertiary	2	2	1	1	3	3
Congenital	....	....	....	....	....	....
Total Syphilis	4	5	1	3	5	8
Gonorrhoea	124	66	24	6	148	72
Granuloma*	....	....	....	....	....	....
Chancroid	1	1	....	....	1	1
Grand Total	129	72	25	9	154	81

* Native.

Appendix XIII

WESTERN AUSTRALIA

DERBY LEPROSARIUM

Admissions and Discharges for the Year 1959, compiled from the Monthly Returns of the Superintendent

Month of Year 1959	Admissions							Discharges											Inmates Remaining in Leprosarium		
	Males			Females			Total Ad-mitted	Males					Females					Total Dis-charged	Males	Females	Total Remain-ing
	Ad-mitted	Re-Ad-mitted	Total Males	Ad-mitted	Re-Ad-mitted	Total Females		Dis-charged Cured	De-ceased	Ab-sconded	Dis-charged Non-In-fectious	Total Males Dis-charged	Dis-charged Cured	De-ceased	Ab-sconded	Dis-charged Non-In-fectious	Total Females Dis-charged				
January	....	....	....	1	....	1	1	4	....	....	....	4	1	....	....	....	1	5	88	58	146
February	....	....	....	....	....	....	....	2	....	....	....	2	....	....	....	....	....	2	86	58	144
March	1	1	2	2	....	2	4	1	....	....	....	1	....	....	....	....	....	1	87	60	147
April	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1	87	59	146
May	....	....	....	1	1	2	2	3	....	....	....	3	1	....	....	....	1	4	84	60	144
June	1	1	2	....	....	....	2	1	....	....	....	1	....	....	....	....	....	1	85	60	145
July	1	2	3	1	....	1	4	3	1	....	....	4	5	....	....	....	5	9	84	56	140
August	1	....	1	....	2	2	3	3	....	....	....	3	4	1	....	....	5	8	82	53	135
September	1	1	2	....	....	....	2	3	....	....	....	3	....	....	....	....	....	3	81	53	134
October	1	....	1	....	....	....	1	4	....	....	....	4	6	1	....	....	7	11	78	46	124
November	....	2	2	....	2	2	4	1	....	....	....	1	2	....	....	....	2	3	79	46	125
December	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	80	46	126
Total	6	8	14	5	5	10	24	25	1	....	....	26	20	2	....	....	22	48	....	....	....

Analysis of Admissions and Discharges During 1959

Inmates as at 31st December, 1958	150
Admissions for period ended 31st December, 1959	24
Discharges for period ended 31st December, 1959	45
Deaths for period ended 31st December, 1959	3
Absconded for period ended 31st December, 1959	–
Total Remaining at Leprosarium, 31st December, 1959	126

Appendix XIV

REPORT FROM THE LIBRARIAN, PUBLIC HEALTH AND MEDICAL DEPARTMENTS' LIBRARY

To the Commissioner of Public Health

I have the honour to submit a report on the activities of the library for the year 1959.

Seen in retrospect it almost seems that one of the main pre-occupations of the library staff during this year was searching for adequate space in which to put the publications received. The allocation of a small amount of basement space and the use of some 100 feet of open steel shelves in a public corridor made little impact on the problem. Since the library serves all sections of the Department, any increase in the work of any one departmental section has a repercussion on the library. When the work of several sections expands rapidly, and that of the Department as a whole fairly steadily, as was the situation during 1959, the impact on the library is considerable. The consequent strain on limited accommodation, already hopelessly overloaded, is nearly unbearable. The efficiency and quality of library services under these conditions simply cannot be maintained.

During 1958, 612 publications were received while in 1959 the number rose to 658. During 1959 on behalf of various sub-libraries an additional 21 journal subscriptions were taken out making a total at the end of the year of 335 separate periodicals regularly received. The total handled is somewhat greater as multiple copies are received of some journals—for example, laboratory journals, tuberculosis journals, dental journals, hospital and nursing journals. At the end of 1959 there was an average regular routing of over 300 items a month.

A great number of serial publications are not as yet catalogued, and until staff is available, there is little hope of this being done, as some of these, like the Medical Research Council's Special Report Series, run into hundreds of publications. Excluding journals and serials of all kinds, bound as well as unbound, the library has now some 4,000 publications. In the past, because of space consideration, the policy has had to be to place as much material as possible in sub-libraries. The main library has approximately 800 of these 4,000 catalogued publications and the bulk of the storage space is taken up by serials and journals. It is greatly to be deplored that the central unit of the library network has available at any moment only one-fifth of its potential material but space limitation is the controlling factor.

During the year, the library was grateful to receive from the State Library a very considerable number of the valuable publications of the United States Public Health Service. In the main these consisted of the Bulletin of the National Institute of Health, the Public Health Reports Supplements, the Public Health Bulletin and several hundred of the Public Health Service Publications Series. None of these items are included in the total of 658 publications received.

In May of this year photocopy equipment was purchased. Although the actual work of the copying was not undertaken by library staff, the extensive requests for photocopies of articles has meant a considerable extra work in locating the originals to enable copies to be made. As the usefulness of this equipment came to be realised more and more so requests for copies increased and by the end of the year photocopies were being requested by virtually all senior staff of the entire Department.

During the year this library borrowed from other libraries 275 items (125 in 1958). Of these 242 were borrowed from other libraries in W.A. (103 in 1958). As was the pattern in previous years the main source of these was the Medical Library with 168 items (43 in 1958). Borrowings from libraries outside the State also increased from 22 in 1958 to 33 in 1959. Of these, 16 items were borrowed from the Barr-Smith Library in Adelaide. It is pleasant to record the very willing and courteous assistance this great library extends to all the W.A. libraries. Inter-library relations in Western Australia itself remain extremely cordial.

Loans from this library to other libraries fell slightly from 264 in 1958 to 247 in 1959. Of these the Medical Library borrowed 89 (163 in 1958), the Institute of Agriculture 62, the Department of Agriculture 21 and the State Library 12. Loans were spread over 21 libraries, Government Departments, non-departmental hospitals and other bodies.

Co-operation between this library and the Medical Library is very close. The two libraries inter-lend and inter-borrow freely. Several of the staff of the department are on routine circulation lists for Medical Library journals and 13 of our journals are sent regularly to the Medical library for display and circulation.

The increased routine work, as illustrated by the figures given, needs additional staff to cope with it. It had been hoped that this could be avoided until reasonable working conditions had been attained or, to put it another way, that more nearly adequate space would be available before the need for an extra pair of hands became really insistent. But the situation has now been reached where help has to be obtained, space limitations or no. It seems that the maximum working space possible for a new assistant, would be a desk area of about three feet by fifteen inches in which a typewriter would be sited. Additional library space is desperately urgent.

JOHN F. WOOLCOTT, M.B., Ch.B.,
Librarian.

Appendix XV

SCHOOL MEDICAL REPORT

Many country schools are not up to date on a two-year inspection schedule and all have been examined within three years.

A total number of 48,321 children were examined, of whom 17,032 were in the country. The parents of 16,221 were notified of some defect or other, including dental defects. Four thousand six hundred and twenty-one were referred for medical attention. Table II shows a good response by the parents in obtaining this medical attention.

A total of 68,129 children were examined for pediculosis (Table III) and the number notified as infected was 135. Re-visits to ensure that effective treatment had been carried out brought the total number of heads inspected up to 100,297.

There is a general impression that the number of cases with ear, nose and throat trouble is decreasing. It is thought that the use of antibiotics for severe throat infections and sinus troubles may be the cause of this.

The general health and nutrition of the children remain good.

Table I

SCHOOL MEDICAL SERVICE

EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOL CHILDREN, 1959

——	Number Examined	Number Notified	Number Referred for Medical Attention	Number Referred for Home Attention and Observation	Number Requiring Dental Attention	Skin Complaints		Nutrition			Eyes Medical Attention	Tonsils Medical Attention
						Number	Per cent.	3	Under 3	Over 3		
Metropolitan Schools												
Boys	15,874	4,983	1,252	1,637	2,874	....	....	14,570	308	996	....	....
Girls	15,415	4,704	1,299	1,333	2,825	....	....	13,718	393	1,304	....	....
Total	31,289	9,687	2,551	2,970	5,699	2,029	1·28	28,288	701	2,300	1,454	169
Country Schools												
Boys	8,624	3,253	1,034	974	1,877	....	....	8,058	148	418	....	....
Girls	8,408	3,281	1,036	1,028	1,888	....	....	7,546	191	671	....	....
Total	17,032	6,534	2,070	2,002	3,765	1,354	1·83	15,604	339	1,089	1,134	105
State Total												
Boys	24,498	8,236	2,286	2,611	4,751	....	....	22,628	456	1,414	....	....
Girls	23,823	7,985	2,335	2,361	4,713	....	....	21,264	584	1,975	....	....
Total	48,321	16,221	4,621	4,972	9,464	3,383	0·70	43,892	1,040	3,389	2,588	274

Table II

HOME VISITING BY SCHOOL NURSES, 1959

Total Visits *re* Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visit to Cases Referred for Home Attention	Parents Phoned or Called at Office
2,969	1,128	1,086	67	697	84	171

Country Areas : 314 visits made.

Table III

HYGIENE INSPECTION BY NURSES FOR PEDICULOSIS

——	No. of Children Examined	Number Notified	Percentage
Metropolitan	51,256	32	·62
Country	16,873	103	·61
Total	68,129	135	·20

Including Revisits to above, a total number of 100,297 Heads were examined or re-examined.

Appendix XVI

REPORT BY SENIOR DENTAL OFFICER

Commissioner of Public Health

Following is my report for the year ending December, 1959.

The Staff position remained fairly constant but there were indications towards the end of the year that there would be several vacancies early in 1960.

Figures concerning the Service compared very well with those of the previous year. They are as follows :—

Number of country schools visited	143
Number of Metropolitan schools visited	13
*Number of Native Missions visited	10
*Number of Orphanages visited	13

* Means both country and Metropolitan.

Number of Children examined	12,595
Number of Children treated	7,079
Number of Children needing no treatment	4,091
Number of Children who were to receive treatment by private dentists	500
Number of Children whose parents did not bother to reply to notices sent out	925

Details of treatment given—

Silver amalgam fillings	8,393
Copper amalgam fillings	1,653
Cement fillings	1,365
Porcelain fillings	721
Silver nitrate treatments	1,428
Other conservative	5,544
Extractions	13,604
Prophylaxis	1,525
Gold Inlays	1
Dentures	3
Orthodontic treatment	6
Pulp (nerve) treatment	115
Talks to P. and C. Associations, personal interviews, etc.	471
X-Rays taken	6

A. G. McKENNA,
Senior Dental Officer.

19th February, 1960.

Appendix XVII

REPORT BY THE CHIEF INSPECTOR

The Commissioner of Public Health

Submitted herewith is a summary of the work of the Inspection Branch for the year 1959.

ENVIRONMENTAL SANITATION

Approval was given for the installation of 8,044 septic tanks ; approximately 30 per cent. of these were designed and intended for the treatment of both sewage and sullage wastes.

Wherever possible pan closets are being replaced by water closets connected to small bacteriolytic treatment tanks. Many local authorites have inaugurated schemes requiring this to be done and have provided financial assistance to householders for this purpose.

With the introduction of water closets using only six pints of water for flushing, many towns previously unable to install septic tanks because of restricted water supplies can now use this method of sewage disposal.

General inspections and investigations were as follows :—

Country towns	120
Housing sub-divisions	217
Hospitals	47
Appeals (Section 37, Health Act)	18
Special investigations	74
Miscellaneous	219
Total	695

Surveys of river and ocean bathing places included the collection of 663 samples of water for bacteriological examination.

Vermin and insect control in Government institutions involved 385 visits by pest control officers.

Late in the year an intensified anti-housefly campaign was commenced and, with the assistance of local authorities and their officers, detailed investigations into the fly breeding potential of the metropolitan area were made. This work will continue in the future and should provide valuable information for use when future fly control measures are being considered.

The work of the general inspection staff has increased in both scope and volume. This increase was such that it was necessary to appoint two additional officers during the year.

FOOD AND DRUGS

The number of animals submitted for inspection by departmental officers at metropolitan abattoirs continues to increase. During the year 1,303,836 animals were inspected ; this represents an increase of 14 per cent. on the previous year's figure.

Details of slaughtering and causes of condemnation are shown in Appendix XXIX.

In addition to the above, 1,061 tons of imported fish and 134 tons of meat were inspected at Fremantle Wharf.

The number of samples of foods and drugs submitted for chemical or bacteriological examination was 154.

PUBLIC BUILDINGS

Two officers formerly employed by the Public Works Department for the examination of plans for public buildings were transferred to the Inspection Branch of this Department during the year.

The change was mainly an administrative one and this Department still receives and is grateful for help and advice from the Principal Architect and his officers and from the officers of the Electrical Section of the Mechanical and Plant Engineer's Branch.

With the help of these officers, a close check has been kept on all public buildings both new and old. Two hundred and twenty-two plans for new public buildings or alterations or additions to existing ones were examined, and a further 100 preliminary plans were checked for compliance with Part VI of the Health Act.

PESTICIDES

Two hundred and twenty-nine applications for registration were considered by the Pesticide Advisory Committee during the year. The total number of pesticides now registered with this Department is 935.

HEALTH INSPECTORS' CONFERENCE

The Annual Health Inspectors' Conference was held in Perth on 30th September and 1st October.

The Conference was opened by the Minister for Health, Hon. Ross Hutchinson, M.L.A., and was followed by an address by the Commissioner of Public Health, Dr. Linley Henzell.

The following addresses were also given :—

- The Objectives of the Swan River Conservation Board (Mr. R. J. Bond, Chairman, Swan River Conservation Board).
- Special Treatments of Concrete and Cement Surfaces (Mr. A. Hansen).
- Some Aspects of Temperature Control in Buildings (Mr. A. C. Douglas, A.R.A.I.A.).
- Laboratory Services and the Health Inspector (Dr. W. Laurie, Director, Public Health Laboratory).
- Observations on a Visit to Europe and North America (Dr. D. J. R. Snow, Director of Epidemiology).

On 1st October delegates were shown over a factory specialising in prepacked frozen food.

C. E. FLOWER,
Chief Inspector.

Appendix XVIII

ANNUAL REPORT FOR NURSING SECTION 1959

Commissioner of Public Health

Hospital Staffing

There is now a greater availability of trained nurses, resulting in a better nursing service in Board and Departmental Hospitals. Although at the time of presenting this Report, the Nurses' (Public Hospitals) Award (No. 19 of 1958) has only been effective since September, 1959, there is a noticeable improvement in the attitude of nurses to country employment and this must be attributed to the Country Service Allowance and to the Medical Department's Bonus of £25 for each satisfactory six months' service.

Staffing the North-West Hospitals no longer presents a problem. The District Allowance, added to other allowances, is a considerable factor in attracting suitable Trained Nurses and Nursing Aides to the remote areas and it is pleasing to record that the nursing service in these hospitals has reached a higher level of efficiency and ethical tone.

With the increased number of Trained Nursing Aides, the time should not be too far distant when the untrained nurse will cease to be employed. It will, however, be necessary to recognise the young girl who is waiting to reach the age of eligibility for General Training and who desires employment in the hospital field. As a Ward Cadet, there is a place for her in the teaching hospital but in the country hospital she is better employed in nursing and becomes a Nursing Assistant. Fortunately, the Matrons are aware of this problem and take care to see that she receives good in-service instruction.

I am pleased to report that there has been no change in Matronships of the Training Schools and the larger hospitals. Miss E. Bohan (Dip. of N. Admin.), was appointed to the Collie District Hospital in January.

NURSING BURSARIES (AS AT 31/12/59)

Bursaries Granted for years	Number Granted	Withdrawals		Expected number of Graduate Nurses to be available for years—						
		No.	%	1959	1960	1961	1962	1963	1964	Total
1955 and 1955–56	45	15	33·3	8	19	2	....	....	....	29
1956 and 1956–57	40	9	22·5	....	2	29	....	....	....	31
1957 and 1957–58	67	18	26·9	....	....	2	46	1	....	49
1958 and 1958–59	52	4	7·7	....	....	1	2	45	....	48
1959 and 1959–60	61	2	3·3	....	....	....	2	4	53	59
Total	265	48	18·1	8	21	34	50	50	53	216

There is a noticeable withdrawal rate, due to a variety of reasons. Although the majority of the bursars complete training, the withdrawals from the bursary obligation are due to marriage, or desire to travel interstate or overseas. Although it may be said that we are not deriving a great deal of benefit from the employment angle under this Bursary Scheme, it is a little early to assess its true value but there is no doubt that the publicity attendant on the issue of bursaries has resulted in an awareness of the need for the prospective nurse to reach a satisfactory educational standard. This has had an impact on the Education Department as well as parents.

SCHOLARSHIPS AWARDED FOR POST GRADUATE STUDY

The following persons were awarded scholarships for study in Diploma Courses at the College of Nursing, Australia, this academic year :—

Miss M. C. Morrissey	Nursing Administration
Mrs. D. Campin	Sister Tutor
Miss M. Hewett	Sister Tutor

The scholarships covered salary, College fees and return fares between Perth and Melbourne.

SPECIAL UNITED KINGDOM NURSING RECRUITMENT SCHEME

This scheme proved rather unproductive this year. Two nurses, both single certificated entered the contract, one of whom commenced training at King Edward Memorial Hospital on her arrival in Perth, and the other, being unsuitable for Midwifery Training for medical reasons, accepted a position at the Margaret River Hospital.

MATRON'S CONFERENCE

The College of Nursing, Australia, conducted a Post Graduate Week : subject—" Administration and Civil Defence," to which members of the Matrons' Association were invited. A number of country Matrons attended and this was made possible by the co-operation of the Medical Department in granting allowances covering salary, living expenses and fares.

SCHOOL MEDICAL SISTERS' REFRESHER WEEK

An Education Course of two weeks duration was held for the School Medical Sisters, from January 19th to January 30th. This was well appreciated but a little too long. Future Courses should be confined to one week.

HOSPITAL INSPECTIONS

Nearly all country hospitals were visited in 1959. This includes the North-West and Eastern Goldfields. In all, 54 Departmental Hospitals were inspected and 42 non-departmental.

PRIVATE HOSPITALS AND MATERNITY HOMES

Routine inspections of Private Hospitals and Maternity Homes were carried out during the year. Number of inspections :—

" A " Class	24
" C " Class	96
Maternity Homes	17

NEW REGISTRATION OF " C " CLASS HOSPITALS

	Total Number of Beds
Niola	12
Mt. Lawley	13
Lesmurdie	11
Seaborne	24
St. Emilies	13
Nonareena	11
Killara	20
Ngal-a	20
St. Rita	21
St. Lukes	12
Anne Marie	23
Woodstock	13
Hardey Lodge	21
Deva	17
Parksight	17
Annesley (Annexe)	10

PROPOSED " C " CLASS HOSPITALS INSPECTED

60 Preston Point Road, East Fremantle.
20 First Avenue, Mount Lawley.
13 Rheola Street, West Perth.
21 Goldsmith Road, Claremont.
Allpike Road, Darlington.
15 Dean Street, Cottesloe.
44 Onslow Road, South Perth.
222 Canning Highway, East Fremantle.
19 Dalgety Street, East Fremantle.
105 Swan Street, Guildford.
Nelson House, Hampton Street, Bridgetown.
93 Railway Parade, Mount Lawley.
12 Chatham Street, West Midland.
28 Florence Street, Rockingham.
231 Charles Street, North Perth.

NURSE TRAINING

Publicity and Recruitment

Miss E. E. Harler, Organiser of Nurse Training, visited country schools when on routine inspections of country Training Hospitals. In addition to talks on nursing and showing of films, many school girls have been interviewed. The school visits and personal contact play a very real part in interesting girls in nursing service. The greater interest seems to be among the sub-junior group and there is still evidence that girls taking Courses leading to Leaving Certificate level being told that Leaving standard is not necessary for General Training.

As a Nursing Exhibition was held in August, the Metropolitan schools were not visited. This Exhibition was most successful and attracted many hundreds of school girls.

Government School of Nursing

When it was known that the lease of Irwin Court would expire in 1960, consideration was given to extending 18 Colin Street, West Perth, and plans are in preparation for additions, including living accommodation and library.

Teaching Staff

Mr. W. H. Maldon returned to the School after successfully obtaining the Sister Tutor Diploma and Mrs. D. Campin will return at the beginning of next year after gaining the Sister Tutor Diploma.

Teaching at Kalgoorlie, Northam and General Hospitals (Three Year Training Schools) is carried out by Tutors without Diploma. Miss Hewett is expected to resume at Kalgoorlie next year after gaining the Sister Tutor Diploma.

Training Hospitals

Narrogin District Hospital (First Year Training School). Training lapsed in 1958 because of lack of interest that recruitment efforts failed to stimulate. The proposed additions to the hospital should create new interest in this centre as a Training School. The South-West Region requires this service, as many young girls do not wish to go to Kalgoorlie for three years training and prefer to remain in their own country district.

Furthermore, Kalgoorlie Hospital is not recruiting sufficient nurses for its needs. When Narrogin and Collie Hospitals were contributing nurses out of First Year Training, it enabled Kalgoorlie to keep up its numbers. The Kalgoorlie Hospital is 20 students below its establishment.

In many centres the local Doctors are generous in the time and interest shown towards student nurses' study, but there is no doubt that the experience for the student nurse in the smaller hospitals is limited. This experience would be widened considerably if a Consultant Service were available at Training Hospitals. The introduction of such a service would result in more interesting nursing and would help to draw more trained nurses to serve in country districts.

The Collie Hospital was registered as a Nursing Aide Training School early this year.

Repatriation General Hospital

The Government School of Nursing is indebted to the Repatriation General Hospital for providing practical experience to the students in the Preliminary Training School. Valuable experience is also given to the Senior Nurses, who are given Instrument Lectures and Observation Tours are arranged for them. Nurses from Geraldton and Northam Hospitals have the advantage of two weeks Theatre experience.

Visits to General Training Hospitals and Nursing Aide Schools

Kalgoorlie	1	Albany	1
Geraldton	1	Collie	1
Northam	1	Busselton	1
		Katanning	1
		Merredin	1
		Mount Henry	1
		Narrogin	1
		Wooroloo	1

School Visits—57

General Nurses in Training, 1959

General Training	181
Commenced Training	56
Completed Training	64
Credits	7
Failures	5
Resigned	6
Terminated	13

(of these 9 transferred to Nursing Aide)

Nursing Aides in Training

Nursing Aides in Training	172
Completed Training	123
Resigned	13
Terminated	7

PHYLLIS F. LEE,
Principal Matron.

21st July, 1960.

Appendix XIX

NURSES REGISTRATION BOARD

The Commissioner of Public Health

I submit the Annual Report for the Nurses' Registration Board for the year ended 31st December, 1959. During the year, 10 Board meetings were held in the Department of Public Health.

EXAMINATIONS

Fourteen examinations for Registration were conducted and included :—

	Examination	Candidates
General Nursing	3	340
Psychiatric	2	9
Dental	1	9
Tuberculosis	3	31
Mothercraft	2	9
Midwifery	3	102
Infant Health	....	....

NURSING AIDE ENROLMENT

Examination	Candidates
3	137

FIRST YEAR GENERAL NURSING

Examination	Candidates
3	474

FIRST YEAR PSYCHIATRIC

Examination	Candidates
2	26

APPLICATIONS FOR REGISTRATION FROM NURSES TRAINED OUTSIDE THE STATE

General	181
Psychiatric	2
Dental	....
Tuberculosis	1
Mothercraft	....
Midwifery	99
Infant Health	18
Nursing Aide Enrolment	9

In April the Secretary, Miss M. Tully, retired and in May Mrs. G. I. Smith was appointed as Secretary.

G. I. SMITH,
Secretary.

Appendix XX

OCCUPATIONAL HEALTH

At the commencement of the year, the time of the Physician, Public Health Department, was allocated almost exclusively to problems of occupational health. During the year, the functions fulfilled in occupational health were :—

(1) Systematic surveys of specific occupational hazards.

(2) Investigations of current problems.

(3) Education.

1. *Surveys*

These were commenced in occupations in which—

(1) Lead and its compounds,

(2) Silica and Asbestos, and

(3) Noise,

were considered to be possible hazards.

(1) *Lead and its Compounds.*—Thirty-two factories were visited. From 25 of these factories, the urine of 77 employees was assayed for lead ; 21 of the 77 were recalled for clinical examination and, in most cases, blood examination. Six employees were found to have lead poisoning ; two others had absorbed lead in excessive amounts. Appropriate treatment and measures were arranged for these men. Follow up was often necessary ; for example in one factory 14 employees had a total of 86 urinary lead assays and 55 clinical examinations. In the same factory atmospheric lead concentrations were undertaken on numerous occasions.

As a result of these, this and one other factory made major alterations and additions in their systems of exhaust ventilation. In others, minor alterations were carried out.

(2) *Silica and Asbestos.*—This is a summary of the survey at the end of 1959 :—

Silicosis

Place of Work	Number Visited	Number in which employees had X-Rays	Number of employees 17 in. x 14 in. Chest Films	Evidence of Silicosis
Foundries	15	7	252	8
Quarries	5	3	70	5
Rock-crushing	2	1	23	1
Potteries and Brickworks	3	2	11	....
Total	25	13	356	14

(a) 12 of 14 cases of silicosis, all of whom presented for clinical examination, were early and without symptoms. The other two, one in a rock quarry and the other in a rock crushing establishment, were moderately advanced. Five had a previous history of gold mining, with normal X-Ray on leaving the mining industry.

(b) The films of 18 other employees suggested that early silicosis might be present. Following clinical examination, the diagnosis was rejected.

Both groups (a) and (b) will be followed up.

Asbestosis

Place of Work	Number Visited	Number of employees 17 in. x 14 in. X-Ray Films	Evidence of Asbestosis
1. Manufacture of asbestos products	1	9	3
2. Packing asbestos fibres for insulation	1	4	....
Total	2	13	3

The employees in Group 1 were a selected group. The sputum of two of the three employees suffering from asbestosis contained asbestos bodies. This hazard has within the year, been reduced by enclosing some, and improving the exhaust ventilation in other, dusty processes.

The silicosis and lead surveys will be continued and probably completed in 1960.

(3) *Noise.*—The management of a large workshop co-operated in a pilot survey on the effects of noise in the workshop area.

The program involved four stages.

(i) A survey of the noise level.
(ii) Medical examination and assessment of hearing loss of employees.
(iii) Advising management on the control of noise.
(iv) Ear protection to selected employees.

Three hundred and one employees were examined and the fitting of ear plugs was commenced.

Noise is a problem which is spread very widely over industry ; and management frequently has a guarded attitude towards the investigation of the problem. For these two reasons the noise survey will take considerably longer to complete.

2. *Investigations of Current Problems*

These were referred by the Factories Branch of the Department of Labour, employers, employees, unions, medical practitioners. The majority related to the inhalation of toxic gases, vapours, or dusts. In the course of these investigations the Physician visited 22 places of work and one private home.

3. *Education*

A series of six lectures was given to 5th year medical students. Towards the end of the year, fortnightly lectures to factory inspectors were commenced.

The two meetings of the Industrial Hygiene Committee of the National Health and Medical Research Council in March and September, were attended by the Physician, who contributed nine papers.

An outstanding feature of the year's work has been the close co-operation between the several departments concerned.

The Chief Inspector of Factories (Department of Labour) readily agreed to full co-operation in the surveys. Mr. T. H. Burgess, Senior Factory Inspector, who has accompanied the Physician of this department on visits to factories, has extensive knowledge of factory conditions, and of their potential hazards. He has been of invaluable assistance.

The Director of the Government Chemical Laboratories (Department of Mines) has made available facilities for chemical investigations. These include all the urinary lead assays and a number of other chemical analyses of specimens ; together with collection and assay of many environmental specimens, such as atmospheric lead. This work undertaken by the Deputy Government Analyst, Mr. N. R. Houghton, and his staff, has been a valuable lead to effective preventive measures.

Mr. Sarfaty of the Commonwealth Acoustic Laboratory has used to the best advantage, in the pilot survey described, his technical organisation which is admirably suited to the assessment of noise in industry and its effect on hearing.

Within this department, the Director of the Tuberculosis Control Branch kindly assented to special sessions for the taking of 17 in. x 14 in. chest films of employees unable to be present at the Perth Chest Clinic during the day. An increasing number of investigations are being undertaken by the Public Health Laboratory.

Clinical examinations of employees have been undertaken by the Physician of this department. At the end of the year arrangements were made with a local general practitioner to continue periodic examinations of employees of the factory mentioned under " Lead." It is hoped that the principle of co-operation with medical practitioners will be extended.

The experience of 1959 indicates that, with this Department acting as a co-ordinating centre, existing facilities in several government departments can efficiently cope with investigations relating to Occupational Health.

Appendix XXI

ANNUAL REPORT OF THE PUBLIC HEALTH DEPARTMENT OF MEDICAL PHOTOGRAPHY

To the Commissioner of Public Health

I have the honour to report on activities for the year ending 31st December, 1959.

Medical photographic services were given to :—

(1) The Public Health Laboratory Service
(2) The Public Health Department
(3) Fremantle Hospital
(4) Princess Margaret Hospital
(5) King Edward Memorial Hospital
(6) University Department of Child Health
(7) Perth Chest Hospital
(8) Consultant medical practitioners.

In addition, photography was carried out for Graylands Hospital, and Claremont Hospital.

From a total of 748 requests, 9,143 photographs were produced, art work and illustrations were undertaken, and cine filming of clinical conditions was done. Over 5,000 miles were travelled. An original paper entitled " The Reproduction of Roentgenograms by Electronic Flash " was published in the August edition of the American Journal of Roentgenology, with Dr. Charles Stuart as joint author. The method described has been in use in this Department for some years, and allows a greater exposure latitude than in most other methods customarily employed.

In July, an appointment of an additional assistant to the temporary staff of this section was made to assist with the increase and complexity of the work undertaken.

In July, the Senior Medical Photographer visited Departments of Medical Photography in Sydney and Melbourne to view their work, apparatus and accommodation. I am confident that our work quality and range of activities can be compared favourably, although staff and working space had been more liberally provided in the establishments visited.

Types of work undertaken during the year included a photographic record of the progression of sanitary landfill, industrial hazards, photo-bronchoscopy, photocystoscopy, retinal photography, intra-oral clinical records, photography of the uterine cervix, photo-keratography and skiagraphs. Clinical photography covering progression and regression of disease and trauma, and photography of post mortem dissections, pathological and bacteriological specimens were routine undertakings. A series of photomicrographs demonstrating some of the strains used in histo-pathology was exhibited in the Perth Museum during the A.N.Z.A.A.S. Congress.

In December, the Senior Medical Photographer was elected a Fellow of the Royal Microscopical Society of Great Britain.

R. PLUMMER, F.R.P.S., F.R.M.S.,
Senior Medical Photographer.

APPENDIX XXII

INFANT HEALTH SERVICE

I have the honour to submit to you a report on the work done by the Infant Health Service, including Pre-School Health, for the year 1959.

During 1959, 73 per cent. of all babies born in the State whose births were notified to the Infant Health Service attended Infant Health Centres.

A total of 15,408 Birth Notifications were received by the Infant Health Service including 593 received by the Correspondence Department.

In 1958, the response to letters of invitation from the Correspondence Department to outback Mothers was 58 per cent. In 1959, the response was 63 per cent.

The gross attendance at Infant Health Centres was 229,431. Individual attendances were 27,482.

The number of individual attendances on first sight appears to be fewer than last year but last year we had only two full-time Pre-School Sisters so that more Pre-School Children were attending the regular Infant Health Clinics. In 1959 there were three full-time Pre-School Sisters who between them saw 2,497 individual Pre-School Children making a total of 29,979 individuals attending at Infant Health and Pre-School Clinics.

Hospital visiting has been a feature of 1959. A total of 11,139 babies were seen in Hospital. It was felt that more visits to Mothers in Hospital would be very valuable so that they could be directed to the Infant Health Centres nearest to their homes. This has been a success.

First home visits were paid to all new babies in the metropolitan and accessible country areas. A total of 10,074 first home visits were paid. Subsequent visits were 10,720, making a total of 20,794.

Analysis of Work Done in Infant Health Centres

Individual attendances at regular Infant Health Clinics	27,482
Individual attendances at Pre-School Clinics	2,497
Total	29,979
Gross attendances at Infant Health Clinics	229,431
Gross attendances at Pre-School Clinics	4,015
Total	233,446
Hospital visits	11,139
Home visits (first)	10,074
Home visits (subsequent)	10,720
Advice by letter	284
Advice by telephone	8,140
Children referred to Doctors	2,984
Mothers referred	445
Expectant Mothers seen at Infant Health Centres	949
Mothercraft Lectures given by Country Sisters	293
Mothercraft Demonstrations by Country Sisters	178

Infant Health Centres in the State at the end of 1959

	Main Centres	Sub-Centres	Stopping Places
Metropolitan	33	92	....
Country	24	191	....
Caravans	4	....	88

There are now 118 Infant Health Buildings which are up to the required standard. There are still a great many sub-standard buildings being used as Infant Health Centres but they are not included in the above figure.

Some Centres are visited by Medical Students, Dietitians from Royal Perth Hospital and Trainees from K.E.M.H. Headquarters were visited by Medical Students, Post Graduate Nurses from P.M.H. and Trainees from Government School of Nursing and certain Mothercraft Classes.

New Buildings were Opened at :—

Alexander Park
Osborne Park
Pingelly
Wyalkatchem (with Quarters)
Bentley Park
North Innaloo

The following buildings are under construction :—
Cowaramup.

Centres in which it is Hoped to Build in 1960 :—

Ardross
Beachlands (with Quarters)
Beeloo
Brentwood
Broome
Lockyer
Floreat Park
Millen
Mt. Hawthorn (No. 2)
Mt. Yokine
Nollamara
Queen's Park
Cockburn Sound

Staff

There are 68 full-time Sisters on the Staff including three Pre-School Sisters.

The Service suffers from continued shortage of staff. There has been a vacancy in Correspondence for six months and owing to Long Service Leave and retirements and sickness, frequent calls for help have to be made on Sisters who have married or are retired. The Service has two Sisters on part-time work at Esperance and Walpole and four part-time relievers who are either married or retired. We are very indebted to these Sisters who come to the rescue for short periods when required to do so. As a result of their co-operation no Centre has had to be closed during 1959.

During 1959 the following Sisters resigned from the Service :—

Sisters Parlato, Formby, Vernon and Rowberry, because of family commitments.
Sister Boyd on her marriage.
Long Service Leave : Sister Williams and Dr. E. M. Gibson.

Special Leave

Sister Terry was granted special leave to go to the United Kingdom to do a Health Education Course. Sister Fry was granted a year's leave to go to Korea to work with the " Save the Children Fund."

Special Appointment

Sister L. Smith of the Gnowangerup Mission was appointed to do part-time work among the native and half-caste Mothers and Children at Ongerup, Tambellup, Borden and Gnowangerup. The idea behind this appointment was to try to improve the wellbeing and nutrition of the native families in the area by advising the Mothers on the best and most nutritious types of food and to show them how best to utilise the food they buy. Sister Smith has the advantage of being in close contact with the Mothers as she delivers them of their babies and so has them under care for about a week in hispotal. They like and trust Sister and this is important in the work she is called upon to do.

Allawah Grove

A Sister holds a weekly clinic in Allawah Grove, in conjunction with a Doctor from Princess Margaret Hospital. The attendances are quite good considering the turnover of residents at Allawah Grove. Many Native Reserves are visited by the Country Sisters in the course of their duties.

Correspondence Section

There has been a further increase in the work of this section. Unfortunately one of the Sisters had to resign and it is very difficult to find a replacement. Many Sisters do not like this type of work with its arduous trips and high pressure office work. There is ample opportunity for further expansion when suitable Sisters are available.

Six visits were made to the North-West, Murchison and Eastern Goldfields. Five visits were paid to Native Reserves and Missions in the South-West in order to see the babies and pre-school children and the native and half-caste girls doing Correspondence Mothercraft. Instructional films were also shown during these visits.

The second film which was made in 1958 with the co-operation of Health Education, has proved to be of great interest to all the people who have viewed it.

The Authoropological Society of Victoria borrowed both films which have been made—" Lily Feeds a Baby " and " Dinnertime " and have enquired whether they can buy copies.

The Maternal and Child Health Section of the Victoria Public Health Department also borrowed both films and wrote favourably about both productions. It is hoped to make a third film in 1960.

The following places were visited :—

Broome, Wyndham, Derby, Port Hedland, Marble Bar, Nullagine, Wittenoom, Meekatharra, Karalundi, Yalgoo, Cue, Mt. Magnet, Roebourne, Point Samson, Onslow, Carnarvon, Cosmo Newbery, Mt. Margaret, Laverton, Leonora, Gwalia, Agnew, Wiluna, Gigalong, Cockatoo Island, Sunday Island, Forrest River Mission, Payne's Find, Menzies, Mt. Ida, Marribank, Gnowangerup, Katanning, New Norcia.

On all these trips the Sisters were alert for any signs of trachoma.

It will not be possible to carry out a full programme in 1960 unless more and suitable staff is found. Personal contact is very important in the work of this section and if that cannot be given, it is feared that there will a falling off of the numbers taking advantage of Correspondence.

INFANT HEALTH CORRESPONDENCE SERVICE

ANNUAL REPORT

1st January, to 31st December, 1959

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Figures
Births Reported	138	162	172	121	593
New Babies	60	95	228	145	528
Requests for Advice *re* Babies	445	657	1,246	1,296	3,644
Individual Babies	255	476	522	404	1,000
Pre-School Children—Advice *re*	38	256	249	377	920
Pre-School Children—Individual	30	250	243	153	595
Expectant Mothers—Advice *re*	24	66	43	54	187
Expectant Mothers—Individual	14	41	24	31	94
Weigh Centres—Attendances	182	391	653	465	1,691
Letters Received—					
Mothers	187	270	268	297	1,022
Others	105	146	177	140	568
School Children	316	1,260	1,524	1,390	4,490
School Children Lessons	332	1,334	1,619	1,478	4,763
Letters Sent—					
Mothers	929	1,105	1,387	1,074	4,495
Others	361	460	521	320	1,662
School Children	402	697	873	803	2,775
School Children Lessons	831	1,607	1,945	1,256	5,639
Visits to Centre—Country—					
Babies	71	54	41	48	214
Pre-School	21	12	20	19	72
Expectant Mothers	6	9	2	1	18
School Children	148	133	37	100	418
School Teachers	22	1	4	15	42
Others	50	39	108	42	239
Telephone Consultations—					
Inward—Country only (Mothers)	14	16	8	21	59
Children from whom Mothercraft Work has been received during the year	208	220	310	235	312

Country trips made	6		
Country visits made	5		
Films, Lectures, Demonstrations, etc.	39		
Mothercraft Children visited in Country Schools	276	Total Audience	1,930

MOTHERCRAFT SECTION

The Sisters still continue to give lectures and conduct examinations to Infant Health Trainees at Ngal-a, at the Government School of Nursing, Kindergarten Training College, Trainee Teachers and Youth Organisations. The Senior Lecturer gave a lecture-demonstration to Medical Students.

The number of Mothercraft Students is fewer than for 1958. This is largely due to the fact that several of the larger high schools were being re-organised and new high schools were built which did not have home science departments ready. Sisters Brady and Parnell when not fully occupied with lecturing and the Trans Train did holiday relief in Infant Health Centres.

The Parentcraft Classes and Expectant Mother Classes conducted by Sister Kerr continue to be very well attended. Grandparents and Adopting Parents too, participated in the instruction given in the Parentcraft Classes.

Sister Kerr, the Senior Mothercraft Lecturer, began Mothercraft Classes for deliquent girls at the Home of the Good Shepherd this year. These classes have proved a great success. Sister reports that the girls are very interested and are showing their interest by turning out very good assignment books. Sister, at the request of the authorities, takes a class every week during the year. After the usual course in Mothercraft she goes on to some instruction in First Aid and simple Home Nursing in which she reports the girls appear to be very interested.

Sister Kerr visits Carnarvon each month and as well as Clinics in the township, etc., conducts the Clinic of the Air. Sister has on several occasions acted as escort to children going to and from Princess Margaret Hospital.

It is felt that if the Mothercraft and Parentcraft Classes continue to expand as rapidly as they have this year, the Senior Mothercraft Lecturer may have to give her full time to this important work.

SUMMARY OF WORK

Metropolitan Schools	No. of Classes	Lectures	Examinations	Students
High Schools	34	269	1	703
Private Schools	4	36	4	137
Trainee Teachers	3	25	3	30
Home of the Good Shepherd	2	23	....	23
	43	353	8	893
Country Schools	33	260	6	738
Total	76	613	14	1,631

Individual Group Lectures

	Lecturer	Classes	Number of Students
Government School of Nursing	Sister Brady	2	36
,, ,, ,, ,,	,, Parnell	2	25
,, ,, ,, ,,	,, Kerr	1	14
Post Graduate Nurses (P.M.H.)	,, Parnell	1	3
,, ,, ,, ,,	,, Kerr	1	8
Medical Students	,, Kerr	1	1
Ngal-a Infant Health Trainee Nurses	,, Kerr	1	6
Scarborough Youth Clubs (Boys and Girls)	,, Kerr	2	36
Total		11	129

Parentcraft

Expectant Parentcraft Classes 3 Series of 6 Lectures	Number of Classes (av. attendance)	Number of Parents (av. attendance)
E.M.S. I.H.C., West Perth	18	93
Birmingham I.H.C., Fremantle	18	96
Expectant Mothers Classes during the year	36	210
Individual Lecture-Demonstrations—		
Expectant Mothers	18	18
Parents Adopting	6	6
Total	94	423

Practical Examinations

Alexandra Home (Mothercraft Nurses)	Examiner	Sister Kerr	1
	Examiner	,, Brady	1

Details of Mothercraft in Schools

Metropolitan Schools	Lecturer	Number of Classes	Lectures	Examinations	Girls
High Schools	Sister Kerr	6	50	1	128
	,, Brady	17	134	....	347
	,, Parnell	11	85	....	228
Private Schools	,, Kerr	1	11	1	44
	,, Brady	3	25	3	93
Trainee Teachers	,, Kerr	2	17	2	20
	,, Brady	1	8	1	10
Home of the Good Shepherd		2	23	....	23
Total		43	353	8	893

Country Schools	Lecturer	Number of Classes	Lectures	Examination	Girls
High Schools—					
Albany	Sister Formby	1	8	1	42
Bunbury	,, Lewin	1	8	....	49
Bunbury	,, Lewin	1	8	....	47
Bridgetown	,, Brockman	1	7	....	11
Beverley	,, Perryman	1	8	....	8
York	,, Perryman	1	8	....	15
Quairading	,, Perryman	1	8	....	9
Bencubbin	,, Miles	1	7	....	8
Boulder	,, Day	1	8	....	19
Eastern Goldfields	,, Day	1	8	1	31
Collie	,, Strudwick	1	8	....	27
Donnybrook	,, F. A. Smith	1	8	....	19
Geraldton 2Q 2L	,, Cowley	1	8	....	33
Geraldton 2B 2P	,, Cowley	1	8	....	29
Katanning Form 11	,, Goode	1	8	....	31
Wagin	,, Gray	1	7	....	18
Kojonup	,, Gray	1	7	....	23
Kellerberrin	,, Luck	1	8	....	19
Cunderdin					
St. Mary's Convent Kalgoorlie	,, Hally-Burton	1	8	....	9
Kwinana	,, Bowell	1	8	....	31
Merredin	,, Fry	1	8	....	11
Mt. Barker	,, F. Leonard	1	8	....	13
Morawa	,, Cameron	1	9	....	12
Northam	,, Barron	1	8	....	86
St. Joseph's Convent Northam	,, Barron	1	7	1	16
Narrogin 2J	,, Taylor	1	8	1	20
Narrogin 3rd Year	,, Taylor	1	8	1	16
Narrogin 4th Year	,, Taylor	1	8	1	13
Pemberton St. Joseph's Convent	,, Kendall	1	8	....	11
Pemberton	,, Kendall	1	8	....	4
Manjimup	,, Kendall	1	8	....	31
Wongan Hills	,, Halse	1	8	....	13
Total		32	252	6	724

Carnarvon

Infant Health Clinics held in Township, Stirling Plantation and East Carnarvon Hall each month.

" Clinic of the Air " from the Royal Flying Doctor Network, Carnarvon Base, conducted monthly and reports given to the Correspondence Section.

June and January trips were done by Sisters Parnell and McGaffin respectively.

Broadcasts

Fifty-two Scripts written and recorded in groups of four, for Broadcasting weekly at Station AM/PM, Perth.

These talks are also Broadcast from Albany, Geraldton and Kalgoorlie Stations.

Twenty-six by Pre-School Section (Sisters Hyde, Birmingham and Wells).

Twenty-six by Mothercraft Lecturer (Sister Kerr).

The Mothercraft Sections of Infant Health moved to 6 Ord Street, West Perth on 11th May, 1959.

Sisters Brady and Parnell relieved at Infant Health Centres in the Metropolitan area during January, February, September, October and November.

During April, Sister Parnell visited the Sisters in the South West and Great Southern Infant Health Centres, who teach Mothercraft in High Schools, to discuss teaching methods and equipment for demonstrations.

Trans Line Trips

Four trips were made in 1959. On the February trip the Medical Supervisor of Infant Health accompanied the team of two Sisters and examined all the children in the Schools on the W.A. side of the line.

The Sisters co-operate with the Salk Vaccine Team which also has the use of the Infant Health Car from time to time. It is interesting to note that practically 100 per cent. of the babies and pre-school children attend these Trans Line Clinics. The double journey is still providing a more satisfactory service than the single journey did. It is a strenuous two weeks for the Sisters who may be on duty for 24 hours at a stretch as the train frequently does not run to schedule.

SUMMARY OF WORK DONE ON THE TRANS TRAIN LINE

		0–2 Years		3–6 Years		7–14 Years		Ex Mothers		Others Seen		Individuals Seen		Vaccines		Total No. People
		Out-ward	Re-turn	Out-ward	Re-turn	Out-ward	Re-turn	Out-ward	Re-turn	Out-ward	Re-turn	Out-ward	Re-turn	Salk	Other	
18th February–5th March	W.A.	14	16	12	11	10	7	1	2	11	9	48	45	....	8	149
(Sisters Parnell and Brady)	S.A.	9	30	....	16	12	5	....	3	2	3	23	57	....	18	137
6th May–22nd May (Dr. Gib-	W.A.	37	27	22	16	43	39	3	6	20	25	125	113	60	17	343
son, Sisters Parnell & Brady)	S.A.	13	37	5	23	1	10	4	4	12	27	35	101	74	10	196
19th August–24th August (Sis-	W.A.	35	....	19	....	6	....	1	....	15	....	76	....	27	4	127
ters Parnell and Brady)	S.A.	14	....	6	....	2	....	5	....	3	....	30	....	17	4	50
25th November–10th December	W.A.	27	16	17	14	7	6	2	1	5	7	58	44	35	18	160
(Sisters Parnell and Brady)	S.A.	12	32	4	9	3	1	3	5	3	24	25	71	67	7	144
		161	158	85	89	84	68	19	21	71	95	420	431	280	86	1,306
		319		174		152		40		166		851		366		

Miss P. Markey joined the staff on 7th September as Receptionist-Typist at 6 Ord Street, West Perth.

Caravans

The four Caravans (88 stopping places) still do good work in outer metropolitan districts.

Some of the driving is over very rough roads and this year has seen frequent breakdowns of the two caravans used over the roughest roads.

It would be a great help if a station waggon was available for the Sisters' use to prevent interruption of this service. A breakdown may mean great inconvenience to Mothers waiting on the roadside in all weathers as Sisters are unable to let the Mothers know that they are delayed. Sometimes other Government Transport is available but frequently there is no other transport. If this service was supplemented by a Station Waggon it would be a great help to all concerned.

Pre-School Section

The Pre-School Training Course was not held this year because of Staff shortages and because the Curriculum has been revised.

The Committee who prepared the new Curriculum were :—

Professor W. B. Macdonald (Chairman), Miss P. Lee, Dr. W. Wyatt, Dr. E. M. Gibson and Sister Jury (Secretary).

The new Curriculum has been submitted to the Nurses' Registration Board for approval.

A third Pre-School Sister joined the two Sisters already on the Staff in 1958. This means that this year we have three full-time Pre-School Sisters.

Section 1.—In the Kindergarten Section of Pre-School Health, Dr. Eksteins and Sister Rogers had a very satisfactory year's work. The following is a summary of the work done in the Kindergartens :—

Metropolitan area one visit	83
Metropolitan area two visits	53
Country visits	37
Total number of visits to Kindergartens	173
Total number of children examined	4,178
Conditions notified to parents	1,825
Referred for medical attention	669
Referred for H.A.	500
Referred for D.A.	644
Number of Children not immunised	80
Underweight Children	38
Pediculosis	3
Parents interviewed	544
Home Visits	252

Section 2.—Pre-School Health in Infant Health Clinics was conducted by the three full-time Infant Health Sisters.

The following is a summary of the work done by the three Pre-School Sisters :—

Gross number of Children seen	4,015
Individual Number of Children seen	2,497
Interviews with local doctors and Officers of other Departments	299
Home Visits	102
Letters written	177
Broadcast Scripts prepared	26

Annual Refresher Course

A successful Refresher Course was held from 27th July, 1959, to 31st July, 1959. The opening address was given by Dr. Henzell in the absence through illness of the Hon. the Minister for Health. Professor W. B. Macdonald gave the inaugural lecture which was much appreciated by all who heard it. The Infant Health Service is most grateful for the excellent advice and assistance which Professor Macdonald continues to give.

The Infant Health Service is also very much indebted to all the Lecturers who give their time in the preparation and delivering of the lectures for Refresher Week. The Sisters return to their work better informed, stimulated and refreshed for a further year's work.

Projects in Infant Health Centres

The following projects were begun in Infant Health Centres in 1959 :—

(1) Urine testing of all babies at their first or second visit to the Centre and again at three months.

(2) A survey of the approximate amount of Vitamin " D " given to babies attending Centres in W.A. was undertaken for the Australian Paediatric Association.

(3) A survey of the attendances at the Infant Health Centres in W.A. for Dr. F. Clements, Institute of Child Health, N.S.W.

(4) A survey on Whole Milk Feeding of Babies attending Infant Health Centres in W.A.

Visitors to Infant Health Headquarters

Visitors to Infant Health Headquarters during 1959 were Professor Elkin, Melbourne. Dr. and Mrs. Dungan, Melbourne. Dr. F. Clements, Sydney. Dr. A. Watson, Leicester, England. Dr. J. Finney, Melbourne. Miss Goundary, Fiji.

Ngal-a

The new Infant Health and Mothercraft Training School was opened in August, 1959.

It is hoped that from now onwards the staff position in the Infant Health Service will be less difficult than it has been for many years.

The first School of six Trainees began on 1st October.

Maternity Hospitals

A special effort has been made during 1959 to do more visiting at the Maternity Hospitals; this resulted in 11,139 Mothers being seen. This may account for the increased numbers attending the Centres as it is felt that personal contact is of extreme importance in Infant Health work.

Lotteries Commission

The Infant Health Service is again indebted to the Lotteries Commission for their continued support of all Infant Health projects. Without this generous help it would be impossible to undertake many a project.

Infant Health Committees

There are still many Committees operating throughout the State mostly in country areas. The Mothers and Babies of W.A. owe a great debt of gratitude to these public spirited people without whose help many of the beautiful Infant Health Centres we have in W.A. could never have been built nor could the Infant Health Service have expanded as rapidly as it has done but for the enthusiasm and help of these excellent Committees.

Infant Health Headquarters Annexe

In May of 1959 it was found that the Staff at Infant Health Headquarters has grown so much that immediate steps had to be taken to find some temporary premises as an Annexe. No. 6 Ord Street was decided upon as temporary premises and the Mothercraft Section and both Sections of Pre-School Health subsequently moved to this Annexe.

Besides being difficult to administer a department in two separate buildings some distance apart, the cost of rental there is fairly high.

An extension to the present Infant Health Headquarters must therefore be undertaken at an early date, in 1960 if possible.

In conclusion I wish to place on record my sincere thanks to the Members of the Infant Health and Pre-School Service for another year of loyal and conscientious service without which the results recorded in this report could not have been achieved.

ELIZABETH M. GIBSON
Medical Supervisor of Infant Health.

Centre	Gross Number of Attendances					Individual Babies Attended					Birth Notifications Received	New Babies	Transfers from Other Centres	Visiting Babies	Individual Expectant Mothers
	Under 12 Months (1)	1–2 Years (2)	Total 1 + 2 (3)	Over 2 Years (4)	Grand Total 3 + 4 (5)	Under 12 Months (6)	1–2 Years (7)	Total 6 + 7 (8)	Over 2 Years (9)	Grand Total 8 + 9 (10)	(11)	(12)	(13)	(14)	(15)
Albany	3,800	245	4,045	140	4,185	342	94	436	74	510	278	218	18	43	8
Applecross	3,822	205	4,027	41	4,068	234	183	417	42	459	255	224	....	....	....
Bassendean	4,964	190	5,154	5	5,159	348	114	462	....	462	272	250	24	30	7
Bayswater	4,381	170	4,551	....	4,551	448	40	488	....	488	292	237	27	48	....
Beverley	2,085	72	2,157	85	2,242	238	67	305	55	360	204	113	14	16	8
Boulder	3,050	230	3,280	158	3,438	239	67	306	90	396	281	262	16	31	5
Bridgetown	3,708	268	3,976	79	4,055	328	90	418	49	467	230	232	18	29	6
Bruce Rock	3,664	114	3,778	17	3,795	397	47	444	14	458	231	240	34	24	4
Bunbury	4,932	303	5,235	42	5,277	482	118	600	25	625	348	313	15	51	1
Busselton	3,956	487	4,443	56	4,499	338	147	485	18	503	250	245	....	43	....
Caravan No. 1	4,253	584	4,837	211	5,048	213	184	397	59	456	246	226	31	7	9
Caravan No. 2	2,415	160	2,575	73	2,648	143	86	229	47	276	....	161	12	17	5
Caravan No. 3	3,246	230	3,476	66	3,542	191	83	274	41	315	132	123	6	17	30
Caravan No. 4	4,099	352	4,451	88	4,539	159	103	262	49	311	160	162	1	21	27
Corrigin	3,516	1,102	4,618	1,066	5,684	220	118	338	195	533	151	232	14	21	137
Carnarvon	438	114	552	65	617	77	54	131	33	164	82	74	10	18	24
Collie	2,762	320	3,082	309	3,391	469	75	544	40	584	176	238	8	29	82
Claremont	4,307	526	4,833	96	4,929	253	95	348	17	365	46	65	6	23	....
Cottesloe	4,563	358	4,921	18	4,939	256	109	365	14	379	202	214	45	69	19
Doubleview	3,627	135	3,762	7	3,769	474	62	536	2	538	247	246	28	70	12
East Victoria Park	5,553	116	5,669	5	5,674	512	39	551	5	556	364	320	34	37	5
Esperance	808	73	881	61	942	47	17	64	5	69	42	40	2	25	11
Fremantle	4,122	214	4,336	48	4,384	464	63	527	16	543	447	375	44	55	2
Geraldton	4,516	229	4,745	25	4,770	453	101	554	12	566	385	331	13	58	1
Gosnells	2,449	294	2,743	349	3,092	230	186	416	215	631	147	141	8	17	3
Hackett Estate	3,190	195	3,385	20	3,405	298	77	375	5	380	232	237	40	15	39
Harvey	2,468	110	2,578	41	2,619	275	53	328	30	358	196	181	14	24	1
Inglewood	4,717	428	5,145	1	5,146	436	63	499	1	500	246	266	27	79	....
Kalamunda	3,734	246	3,980	42	4,022	422	64	486	16	502	224	152	27	39	6
Kalgoorlie	4,365	367	4,732	235	4,967	282	196	478	103	581	392	297	17	78	3
Katanning	2,441	144	2,585	31	2,616	334	30	364	11	375	305	189	18	14	....
Kellerberrin	2,323	213	2,536	149	2,685	246	57	303	70	373	165	171	6	29	52
Kensington	4,363	52	4,415	2	4,417	412	56	468	....	468	226	236	15	9	....
Leederville	4,786	262	5,048	59	5,107	327	70	397	19	416	315	295	63	88	44
Manjimup	2,759	207	2,966	164	3,130	240	60	300	47	347	252	245	....	41	....
Maylands	4,532	133	4,665	4	4,669	465	81	546	4	550	299	316	30	42	....
Melville	4,098	156	4,254	....	4,254	438	51	489	....	489	241	217	19	24	....
Midland Junction	3,575	183	3,758	5	3,763	385	84	469	4	473	286	248	27	67	1
Mingenew	3,343	398	3,741	280	4,021	240	182	422	116	538	280	240	24	27	22
Moora	3,223	365	3,588	230	3,818	457	95	552	59	611	268	245	22	62	36
Mt. Barker	2,073	356	2,429	582	3,011	290	59	349	102	451	159	186	13	34	56
Mt. Hawthorn	2,305	44	2,349	1	2,350	330	4	334	1	335	152	....	11	39	....
Mt. Pleasant	4,445	113	4,558	25	4,583	523	82	605	21	626	341	286	45	10	....
Mosman Park	3,473	234	3,707	138	3,845	188	148	336	52	388	232	178	23	42	....
Narrogin	2,865	309	3,174	108	3,282	425	129	554	66	620	308	262	14	22	4
North Perth	4,350	229	4,579	18	4,597	491	72	563	....	563	310	271	30	79	....
Northam	2,308	217	2,525	82	2,607	250	97	347	55	402	225	187	17	32	2
Osborne Park	4,136	108	4,244	1	4,245	506	81	587	1	588	603	354	38	44	....
Perth	3,564	308	3,872	167	4,039	429	198	627	50	677	335	291	59	249	112
Pinjarra	2,068	145	2,213	21	2,234	159	52	211	8	219	186	125	19	115	....
Rivervale	3,678	93	3,771	23	3,794	511	32	543	....	543	451	303	33	41	6
Rockingham	2,324	173	2,497	22	2,518	320	75	395	8	403	149	138	14	57	19
Scarborough	4,112	142	4,254	1	4,255	356	58	414	....	414	264	229	24	35	41
South Perth	4,327	171	4,498	16	4,514	330	47	377	4	381	329	277	30	47	11
Subiaco	2,680	298	2,978	431	3,409	271	186	457	279	736	175	196	31	52	19
Swanbourne	836	....	836	....	836	62	....	62	....	62	26	33	4	1	....
Victoria Park	3,139	122	3,261	....	3,261	254	50	304	....	304	121	180	24	234	2
Wembley	4,215	186	4,401	50	4,451	352	79	431	15	446	270	270	31	45	36
Wagin	2,665	168	2,833	53	2,886	381	52	433	16	449	254	191	6	9	1
West Perth	1,076	90	1,166	67	1,233	86	34	120	24	144	59	68	4	19	25
Willagee	2,920	115	3,035	28	3,063	377	40	417	....	417	222	231	27	53	3
Wyalkatchem	2,414	112	2,526	16	2,542	295	40	335	4	337	249	198	22	17	2
Total	208,924	14,283	223,207	6,224	229,431	19,998	5,176	25,174	2,308	27,482	14,815	13,271	1,296	2,696	949

Centre	Medical Visits										In-effective	Total 23–26	Advice by Letter	Advice by Telephone	Mother Referred Correspondence Sister	Lectures Given	Group Demonstrations
	Doctor		Hospital		Total		Home										
	Baby Referred	Mother Referred	Baby Referred	Mother Referred	Babies Referred 16 + 18	Mothers Referred 17 + 19	Hospital (No. of Babies)	To Babies, First	To Babies, Subsequent	Expectant Mothers							
	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)
Albany	89	10	....	....	89	10	250	73	204	....	41	318	3	105	2	12	6
Applecross	88	19	2	....	90	19	....	264	287	1	17	569	....	328	....	....	....
Bassendean	34	3	....	....	34	3	....	245	235	....	10	490	1	43	....	....	....
Bayswater	38	4	....	....	38	4	....	257	32	....	33	322	41	21	1	....	....
Beverley	53	11	....	....	53	11	150	43	44	5	5	97	7	65	20	14	16
Boulder	82	9	....	....	82	9	570	96	25	....	7	128	....	34	29	14	2
Bridgetown	13	4	....	....	13	4	207	13	138	1	5	157	....	129	....	7	1
Bruce Rock	76	4	2	....	78	4	336	45	18	....	5	68	....	16	5	7	....
Bunbury	60	6	....	....	60	6	....	257	57	....	63	377	....	125	....	23	....
Busselton	47	1	1	....	48	1	....	70	36	....	9	115	....	....	....	....	1
Caravan No. 1	82	11	....	....	82	11	....	202	69	6	57	334	19	....	....	....	....
Caravan No. 2	28	2	....	....	28	2	82	74	36	....	15	125	....	....	....	....	....
Caravan No. 3	36	11	....	....	36	11	....	120	1,519	1	12	1,652	....	56	....	....	....
Caravan No. 4	26	10	....	....	26	10	176	....	....	....	....	....	....	....	....	....	....
Corrigin	86	3	....	....	86	3	217	23	233	....	....	256	....	83	7	....	....
Carnarvon	11	3	4	1	15	4	41	49	24	1	3	77	10	9	8	10	....
Collie	75	50	....	....	75	50	311	305	497	86	....	888	131	160	18	16	16
Claremont	9	....	1	1	10	1	....	68	60	....	5	133	....	36	....	....	....
Cottesloe	27	2	5	....	32	2	....	217	143	1	3	364	....	207	....	....	....
Doubleview	92	....	....	....	92	....	....	227	163	....	2	392	....	530	....	....	....
East Victoria Park	47	8	....	....	47	8	....	350	70	....	45	465	....	84	1	....	....
Esperance	10	10	....	....	10	10	39	2	24	....	....	26	....	....	....	....	....
Fremantle	50	1	....	....	50	1	438	423	329	....	8	760	....	631	....	....	....
Geraldton	19	2	1	....	20	2	387	20	12	....	24	56	....	72	....	24	....
Gosnells	28	2	6	1	34	3	....	95	561	....	52	708	....	6	....	....	....
Hackett Estate	35	8	....	....	35	8	....	219	393	16	44	672	....	120	....	....	....
Harvey	13	1	....	....	13	1	120	....	15	1	....	16	....	1	4	15	....
Inglewood	43	7	....	....	43	7	....	200	36	....	25	261	2	69	....	....	....
Kalamunda	43	7	....	....	43	7	....	89	147	10	63	309	....	92	....	....	....
Kalgoorlie	58	24	....	....	58	24	....	448	26	....	48	522	1	281	6	7	3
Katanning	3	....	....	....	3	....	243	35	31	....	5	71	....	....	7	8	....
Kellerberrin	106	4	2	2	108	6	177	43	133	3	6	185	16	96	3	16	....
Kensington	14	....	....	....	14	....	52	282	87	....	....	369	....	392	....	....	....
Leederville	49	12	8	....	57	12	231	320	277	6	100	703	2	205	6	....	....
Manjimup	57	....	....	....	57	....	228	38	37	....	....	75	....	44	....	....	....
Maylands	27	4	1	....	28	4	....	231	93	....	87	411	....	48	4	....	....
Melville	47	4	....	....	47	4	....	225	546	....	....	771	....	406	....	....	....
Midland Junction	37	5	1	....	38	5	523	220	70	....	17	307	....	24	....	....	....
Mingenew	83	22	5	....	88	22	243	15	58	8	4	85	16	120	2	9	1
Moora	8	1	....	....	8	1	206	....	55	....	....	55	....	4	10	....	....
Mt. Barker	41	11	....	....	41	11	164	33	142	13	7	195	10	36	2	5	4
Mt. Hawthorn	14	....	....	....	14	....	1,042	124	138	....	....	262	....	26	1	....	....
Mt. Pleasant	133	12	....	....	133	12	....	287	362	....	....	649	16	112	5	....	....
Mosman Park	53	3	2	....	55	3	1,076	218	126	....	....	344	....	59	....	....	....
Narrogin	27	8	....	....	27	8	411	116	168	1	23	308	3	124	....	26	6
North Perth	108	19	....	....	108	19	....	267	89	....	53	409	....	182	....	....	....
Northam	24	4	....	....	24	4	203	185	62	....	18	265	....	91	....	24	2
Osborne Park	2	....	....	....	2	....	....	341	263	....	60	664	....	12	....	....	....
Perth	72	9	....	....	72	9	....	335	369	3	64	771	....	514	....	....	....
Pinjarra	50	14	....	....	50	14	104	4	10	4	1	19	....	17	3	....	....
Rivervale	64	7	2	....	66	7	....	274	182	....	11	467	....	5	2	....	....
Rockingham	14	....	....	....	14	....	161	112	36	....	11	159	....	39	3	18	1
Scarborough	73	29	....	....	73	29	....	243	245	3	....	491	....	606	....	....	....
South Perth	78	18	....	....	78	18	154	290	176	....	88	554	1	277	....	2	2
Subiaco	42	1	13	....	55	1	819	238	408	7	7	660	....	383	....	....	....
Swanbourne	10	3	....	....	10	3	....	25	32	....	....	57	....	76	....	....	....
Victoria Park	22	3	....	....	22	3	157	288	45	....	....	333	....	316	....	....	....
Wembley	25	4	....	1	25	5	....	255	101	1	14	371	....	68	....	....	....
Wagin	38	6	....	....	38	6	116	35	374	6	25	440	1	72	3	20	3
West Perth	13	....	1	....	14	....	1,372	41	49	2	10	102	....	397	....	....	....
Willagee	247	7	13	....	260	7	22	283	444	....	4	731	....	118	4	....	114
Wyalkatchem	5	2	....	....	5	2	111	177	79	....	20	276	3	8	....	16	....
Total	2,984	445	70	6	3,054	451	11,139	10,074	10,720	186	1,236	22,216	284	8,140	156	293	178

Appendix XXIII

HOSPITAL PLANNING–METROPOLITAN AREA

It is proposed to deal with this under three headings :—

1. The Hospital Bed situation.
2. Hospital provision for accident cases.
3. Proposed new General Hospitals.

HOSPITAL BED SITUATION

In the 1950 Report after an extensive examination of the problem, the following figures were arrived at as hospital bed requirements for the metropolitan area.

General Hospital Beds	....	5·56 per 1,000 population.
Chronic Hospital Beds	....	2·9 per 1,000 population.

Three major factors may affect the application of these figures to today's requirements. These are :—

1. Alteration in age of population.
2. Changed socio-economic factors such as National Health Insurance Scheme.
3. Changed medical techniques, etc.

These factors may not only alter total hospital requirements but may also alter demands for particular class and type of hospital.

It is therefore interesting and enlightening to apply the 1950 figures for hospital bed requirements to 1960 and study the altered picture of hospital bed supply and demand.

		No. Reg'd.	No. Available	Deficit or Surplus
1950—Population 324,000	General Beds	1,801	1,783	— 18
	Chronic Beds	939	452	— 487
1960—Population 400,000	General Beds	2,224	2,196	— 28
	Chronic Beds	1,160	1,477	+ 317

The increase of 413 in General Beds during the last 10 years is comprised of—

Royal Perth Hospital	150
Fremantle Hospital	40
Chest Hospital (Non T.B.)	50
South Perth	27
St. Joseph	34
St. John, Belmont	38
Bethesda	21
Lister	21
St. Annes	17

plus minor additions to other " A " class hospitals.

The increase of 1,025 in chronic beds is comprised of—

Sunset (conversion)	80
Mt. Henry	120
Home of Peace	112
Wooroloo (Non T.B.)	150

plus an enormous increase in " C " class hospitals, several of them previously registered as boarding houses.

The increase in General Beds has therefore been maintained in proportion to the increase in population and the big deficiency in Chronic Beds has been eliminated and an apparent surplus exists. The hospital bed position therefore appears to be in a far less critical condition than it was 10 years ago when the big deficiency in Chronic Beds created an overflow of chronic cases into general beds and caused a critical shortage of acute general beds.

Before this apparent improvement can be accepted as real, it is necessary to ascertain if the three factors previously mentioned have affected the application of 1950 standards of bed requirement to 1960 conditions.

1. *Alteration in Age of Population*

As 40 per cent. of cases admitted to Royal Perth Hospital and 25 per cent. of cases admitted to Fremantle Hospital are 60 years of age and over it is obvious that old age puts a considerable demand on hospital beds both on acute and much more so on chronic beds. An increase in this proportion of our population would therefore make our standards of 5·56 and 2·9 inoperative. No such increase has occurred, in actual fact the proportion of the population 65 years and over has dropped slightly in the last 10 years.

A great increase has taken place numerically and proportionately in the under 14 age group. This has made tremendous increases in the school age group and the demand for school buildings. The situation today however regarding children's hospital beds is far more satisfactory than it was 10 years ago although no beds have been added in that time. This is due to factors 2 and 3. The introduction of a National Health Scheme and the end of free hospital treatment induced parents to make greater efforts to look after their children at home and as most diseases of childhood have their origin in infection, improved antibiotic therapy and the availability of free antibiotics as Pharmaceutical Benefits have made it easier for them to do so.

2. *Effect of National Health Scheme*

This has increased the demand for hospital beds for the chronic case. Hospital Benefits now make possible prolonged stay in hospital outside a free public hospital. It has led to the enormous growth in " C " class hospitals and an opportunity for chronic cases, particularly in the older age groups, to obtain some degree of hospital comfort and attention where previously many of them languished in a type of boarding house.

This increased demand in no way alters the applicability of our figure of 2·9 per 1,000 as that was determined not on the use made of existing chronic beds but from an examination of the number of chronic cases in the community.

The effect on the younger age groups has already been discussed.

3. *Altered Medical Techniques and availability of new drugs* may have an effect on the demand for hospital beds. The main effect as shown in the young age groups is to reduce the demand either by prevention or so facilitating treatment that it may be performed at home. In certain diseases, however, the demand may be increased because a new technique gives hope of cure or amelioration where previously because of the hopelessness of the case there was no justification for admission to hospital. A number of major surgical cases come within this category and in general they require prolonged hospital care. A great increase in such cases may therefore increase the demand for hospital beds by increasing the average length of stay in hospital. If such circumstances applied generally our figure of 5·56 would not be equally applicable today as it was 10 years ago.

The following table indicates the change in the average length of stay of patients in the three major hospitals.

	Average No. of days stay in hospital per patient.	
	1950	1958
Royal Perth Hospital	14·9	19·5
Fremantle Hospital	13·5	11·2
Princess Margaret Hospital....	13·6	9·76

The decrease in the average stay in hospital at Fremantle and Princess Margaret is probably a far more accurate picture of the general hospital position than the marked increase at Royal Perth Hospital. This increase at Royal Perth Hospital is due in part to the increased complexity of the major cases admitted and to the large proportion of old people admitted to that hospital. The increased average stay at Royal Perth Hospital has, however, a considerable influence on the overall demand for beds, and no firm figure can be set for general hospital bed requirements using Royal Perth Hospital as a criterion until there is suitable evidence of the economic use of beds in that hospital. It is therefore highly probable that our 1950 estimated requirement of 5·5 general beds per 1,000 of the population is an over-estimate for today's requirements.

It would therefore seem that at present our general and chronic beds are adequate as far as concerns the needs of the patient and that planning of new hospitals should be concerned with meeting the needs of the growing population.

The population increases at the approximate rate of 2 per cent. per year. In five years then, the 400,000 metropolitan population will become 441,600 and in 10 years it will be 487,600. At 5·56 beds per 1,000 therefore, we will require in five years 231 and in 10 years 487 more general beds to maintain the same bed position that we have today if the use of hospital beds remains the same.

It is essential that we plan this expansion in general hospital beds now to ensure that their type and situation are best suited to the needs of the State.

HOSPITAL PROVISION FOR ACCIDENT CASES

During 1958 the following were the numbers of accident cases admitted to the three major hospitals and the proportion of beds occupied by such cases in each hospital.

	Number of Cases	Per cent. of Total Beds
Royal Perth Hospital	1,591	20·14
Fremantle Hospital	1,165	21·28
Princess Margaret Hospital	958	14·54

Use is also made of private hospitals for the treatment of accidents but the proportion of accident cases to other cases is in such hospitals very much smaller than in the major public hospitals.

It is obvious that accidents are a major and probably growing factor in the demand for hospital beds. There is at present considerable activity in the field of accident prevention, in the home, in the factory and on the road. With increasing industrialisation and the increased density of traffic, however, it is unlikely that any appreciable reduction in the demand for hospital beds for this type of case will occur.

It has been suggested that special units and even special hospitals should be organised for the treatment of accidents. The suggestion regarding a special hospital for accidents arises mainly from the requirement of departments for specialised surgery such as neurosurgery, orthopaedic surgery, thoracic surgery and plastic surgery, in the treatment of accident cases and from the fact that the State's population could support one team only in most of these branches.

The idea of one hospital to treat accidents is, however, unreal in that no one could expect an ambulance driver to drive past the casualty department of one hospital to take his accident case to a special hospital five to ten miles further on and neither could he be expected to know which case required highly specialised treatment and which did not. It is, I think, absolutely essential that all general hospitals with fulltime staffs have a casualty department and that these departments are organised to receive accident cases and provide them with resuscitation and other life-saving treatments. The relatively few cases that cannot be adequately treated without the highly specialised techniques not available in all general hospitals can be transferred to a hospital with the required facilities at a suitable time after they have received the initial life-saving treatment in the hospital to which they are first admitted.

The situation therefore of the hospital with the highly specialised facilities is relatively unimportant. The important thing is to distribute general hospitals to serve best the needs of the population and to ensure that each has an effective casualty department and an effective organisation to deal with the immediate needs of the accident case. The idea of a hospital with all the highly specialised techniques is however a good one because of the close co-operation that can be obtained between such teams. Such a hospital should not however be considered as an accident hospital only, or as a hospital to which accidents need necessarily be directly taken.

PROPOSED NEW GENERAL HOSPITAL

Several years are required to plan and build a large general hospital. Our figures indicate that a new general hospital of 300 beds will be required in 6–7 years time. There is therefore a degree of urgency in the need to commence planning such a hospital, and many problems to be resolved in determining the type of hospital to be built, where it is to be built, and its exact function and method of functioning. In resolving these problems such things as the changing geographical distribution of the metropolitan population must be considered, and the changing age distribution in the population, also alterations that occur in the demand for hospital beds brought about by new medical techniques and changes in socio-economic factors such as new National Health schemes and alterations in the earning capacity of the population. In addition to the above, we have a complication new in the experience of this State, the need to consider in our plan for metropolitan hospitals the requirements of our new Medical School and the suitability in site, architecture and function of any large hospital which is to play a major part in medical undergraduate and post-graduate teaching.

W. S. DAVIDSON, M.B., Ch.B., D.P.H.

Appendix XXIV

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital

ALL PATIENTS DISCHARGED, 1958, IN AGE GROUPS

Age Group	Cases			Total Days Stay in Hospital			Average No. Days in Hospital	
	Male	Female	Per cent. of Total	Male	Female	Per cent. of Grand Total	Male	Female
0–14	3,919	2,831	31·8	35,118	27,599	19·63	8·9	9·7
15–19	518	565	5·1	7,656	5,172	4·02	14·8	9·2
20–29	878	1,156	9·6	13,568	10,881	7·65	15·5	9·4
30–39	859	1,057	9·0	13,722	13,133	8·41	15·9	12·4
40–49	953	920	8·8	17,644	15,000	10·22	18·5	16·3
50–59	1,107	875	9·3	22,716	16,650	12·32	20·5	19·0
60–69	1,206	1,170	11·2	25,638	24,636	15·74	21·3	21·1
70 and over	1,668	1,571	15·2	34,061	36,297	22·02	20·4	23·1
Total	11,108	10,145	100·0	170,123	149,368	100·00	15·3	14·7
Male and Female	21,253			319,491			15·0	

Daily Bed Average : 875·32

OPERATION CASES IN AGE GROUPS, 1958

Age Group	Cases			Total Days Stay in Hospital			Average No. Days in Hospital	
	Male	Female	Per cent. of Total	Male	Female	Per cent. of Grand Total	Male	Female
0–14	1,507	2,482	18·8	14,310	9,942	7·6	9·5	4·0
15–19	303	278	2·7	5,265	2,783	2·5	17·4	10·0
20–29	433	640	5·0	8,030	6,088	4·4	18·5	9·5
30–39	388	574	4·5	6,914	7,248	4·4	17·8	12·6
40–49	410	433	4·0	9,276	6,894	5·1	22·6	15·9
50–59	429	407	4·0	10,839	7,718	5·8	25·3	19·0
60–69	500	519	4·8	12,057	12,184	7·6	24·1	23·5
70 and over	668	565	5·8	15,985	16,319	10·1	23·9	28·9
Total	4,638	5,898	49·6	82,676	69,176	47·5	17·8	11.7
Total Male and Female	10,536			151,852			14·4	

Daily Bed Average : 416·03

ROYAL PERTH HOSPITAL, FREMANTLE HOSPITAL AND PRINCESS MARGARET HOSPITAL

PATIENTS DISCHARGED DURING 1958

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand	Average Number Days in Hospital		Results *						
			Male	Female	Male	Female		Male	Female	Sex	1	2	3	4	5	6
1	Tuberculosis, all forms	001–019	65	46	2,164	1,852	1·27	33	40	M.	8	36	18	....	2	1
										F.	1	33	11	....	....	1
2	Syphilis, Gonorrhoea and other Venereal Diseases	020–039	20	7	961	121	·34	48	17	M.	1	11	6	....	1	1
										F.	....	5	2	....	....	....
3	Other Infectious Diseases	040–138	317	312	4,102	3,414	2·37	13	11	M.	65	227	18	....	5	2
										F.	51	228	26	....	4	3
4	Malignant Neoplasms including those of lymphatic and haematopoietic systems	140–205	694	502	15,453	12,673	8·87	22	25	M.	16	333	177	1	61	106
										F.	18	258	127	....	36	63
5	Benign and Unspecified Neoplasms	210–239	107	180	1,968	2,596	1·44	18	14	M.	14	62	27	....	3	1
										F.	43	112	20	....	4	1
6	Allergic Disorders	240–245	118	111	1,309	990	·73	11	9	M.	2	114	2	....	....	....
										F.	4	101	5	....	1	....
7	Diseases of Thyroid Gland	250–254	6	34	156	619	·24	26	18	M.	1	5	....	....	....	....
										F.	4	27	3	....	....	....
8	Diabetes Mellitus	260	60	95	1,176	2,345	1·11	20	25	M.	1	43	15	....	....	1
										F.	1	67	18	....	5	4
9	Diseases of Other Endocrine Glands	270–277	13	14	91	246	·11	7	18	M.	....	8	5	....	....	....
										F.	....	7	4	....	1	2
10	Avitaminosis and other Metabolic Diseases	280–289	36	30	575	895	·46	16	30	M.	2	24	7	....	1	2
										F.	....	23	5	....	....	2
11	Diseases of Blood and Blood-forming Organs	290–299	78	92	1,393	1,263	·84	18	14	M.	....	58	19	....	1	....
										F.	2	64	20	....	5	1
12	Mental, Psychoneurotic and Personality Disorders	300–326	296	340	5,042	6,691	3·70	17	20	M.	6	169	116	....	....	5
										F.	4	223	112	....	....	1
13	Vascular Lesions affecting Central Nervous System	330–334	159	159	4,036	4,254	2·62	25	27	M.	2	73	25	....	14	45
										F.	....	62	14	....	30	53
14	Inflammatory and Other Diseases of Central Nervous System	340–357	185	117	3,729	2,974	2·12	20	25	M.	9	85	76	....	5	10
										F.	2	66	43	....	3	3
15	Diseases of Nerves and Peripheral Ganglia	360–369	24	31	1,290	553	·58	54	18	M.	....	16	6	....	....	2
										F.	1	27	3	....	....	....
16	Diseases of Eye	370–389	334	365	4,560	4,568	2·88	14	12	M.	24	286	23	....	1	....
										F.	28	304	30	....	....	3
17	Diseases of Ear and Mastoid Process	390–398	164	136	1,452	1,431	·91	9	10	M.	8	148	8	....	....	....
										F.	5	128	2	....	....	1
18	Rheumatic Fever and Chronic Rheumatic Heart Disease	400–416	61	102	1,775	2,830	1·45	29	28	M.	1	50	8	....	1	1
										F.	5	82	12	....	1	2
19	Diseases of the Heart and Arteries including Hypertension and Arteriosclerosis	420–456	559	441	12,491	10,205	7·16	22	23	M.	9	359	62	....	36	93
										F.	2	301	46	1	36	55
20	Diseases of Veins and other diseases of circulatory system	460–468	151	197	3,049	2,917	1·88	20	15	M.	22	114	9	....	4	2
										F.	24	160	11	....	2	....
21	Diseases of Respiratory System	470–527	1,593	1,241	12,780	9,704	7·09	8	8	M.	209	1,287	51	1	18	27
										F.	179	992	43	....	8	19

22	Diseases of Buccal Cavity and Oesophagus	530–539	135	122	506	560	·34	4	5	M.	22	111	2	....	....	....
										F.	18	98	4	....	....	2
23	Diseases of Stomach and Duodenum	540–545	243	120	4,204	2,099	1·99	17	17	M.	22	196	13	....	7	5
										F.	14	86	10	....	3	7
24	Appendicitis	550–553	295	235	2,535	1,864	1·39	9	8	M.	78	212	4	....	1	....
										F.	78	154	2	....	1	....
25	Hernia of Abdominal Cavity	560–561	282	130	3,350	1,966	1·68	12	15	M.	56	209	10	....	3	4
										F.	31	87	10	....	1	1
26	Other Diseases of Intestines and Peritoneum	570–578	342	363	5,086	4,566	3·05	15	13	M.	58	255	11	....	4	14
										F.	53	274	20	....	8	8
27	Diseases of Liver and Gallbladder	580–586	105	243	1,960	3,789	1·81	19	16	M.	14	68	12	....	6	5
										F.	42	167	19	....	8	7
28	Diseases of Pancreas	587	19	31	268	445	·22	14	14	M.	1	11	4	....	2	1
										F.	3	15	9	....	1	3
29	Nephritis and Nephrosis	590–594	65	75	1,877	1,930	1·20	29	26	M.	1	52	4	....	3	5
										F.	....	63	7	....	3	2
30	Other Diseases of Urinary System	600–609	187	218	2,739	2,982	1·81	15	14	M.	16	149	15	....	3	4
										F.	22	162	30	....	3	1
31	Diseases of Male Genital Organs	610–617	283	....	5,195	....	1·64	18	....	M.	35	193	28	....	9	18
										F.	....	....	....	....	....	....
32	Diseases of Breast	620–621	5	31	41	270	·09	8	9	M.	1	2	2	....	....	....
										F.	8	19	4	....	....	....
33	Diseases of Female Genital Organs, Uterus, Ovary, Fall. Tubes, Parametrium	622–637	....	515	....	4,982	1·57	....	10	M.	....	....	....	....	....	....
										F.	88	372	54	....	1	....
34	Complications of Pregnancy	640–649	....	118	....	1,178	·37	....	10	M.	....	....	....	....	....	....
										F.	30	82	6	....	....	....
35	Abortion	650–652	....	506	....	1,914	·60	....	4	M.	....	....	....	....	....	....
										F.	229	273	4	....	....	....
36	Delivery Complications and Complications of Puerperium	660–689	....	23	....	48	·01	....	2	M.	....	....	....	....	....	....
										F.	3	19	1	....	....	....
37	Diseases of Skin and Cellular Tissue	690–716	336	318	5,614	5,352	3·46	17	17	M.	34	288	12	....	1	1
										F.	33	273	9	....	1	2
38	Arthritis and Rheumatism except Rheumatic Fever	720–727	112	98	2,860	3,172	1·90	26	32	M.	4	92	16	....	....	....
										F.	2	77	17	....	....	2
39	Osteomyelitis and other Bone and Joint Diseases	730–738	174	101	4,566	2,996	2·39	26	30	M.	10	145	18	....	1	....
										F.	3	85	13	....	....	....
40	Other Diseases of Musculo-skeletal system	740–749	50	88	613	1,050	·52	12	12	M.	4	39	7	....	....	....
										F.	6	77	5	....	....	....
41	Congenital Malformations	750–759	185	134	2,497	1,999	1·42	13	15	M.	15	102	51	....	14	3
										F.	14	61	54	....	3	2
42	Birth Injuries, Infections of Newborn	760–776	70	55	645	501	·36	9	9	M.	5	55	4	....	5	1
										F.	8	43	2	....	2	....
43	Symptoms referable to systems or organs	780–789	585	591	5,495	5,917	3·60	9	10	M.	32	470	70	....	3	10
										F.	26	474	85	....	2	4
44	Ill-defined diseases	790–795	95	109	1,001	1,326	·73	10	12	M.	1	58	23	3	3	7
										F.	2	64	31	5	3	4
	Total	....	8,608	8,776	130,604	124,047	80·35	....	....	....	1,896	12,510	1,937	11	394	636
45	Fractures of skull and face bones	N800–N804	215	70	2,972	1,177	1·31	14	17	M.	8	189	10	....	....	8
										F.	....	63	2	....	....	5
46	Fractures and Dislocations of Vertebral Column	N805–N806	57	17	3,950	985	1·56	69	58	M.	....	49	6	....	....	2
										F.	....	16	....	....	....	1

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital

PATIENTS DISCHARGED DURING 1958—*continued*

Item	Disease	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Grand Total	Average Number Days in Hospital		Result *						
			Male	Female	Male	Female		Male	Female	Sex	1	2	3	4	5	6
47	Other Fractures of Trunk, Sternum and Larynx	N807–N809	64	44	1,948	1,104	·96	30	25	M.	4	56	....	....	1	3
										F.	3	38	1	....	....	2
48	Fractures of Upper Limb	N810–M819	252	115	1,731	692	·76	7	6	M.	6	236	9	1	....	....
										F.	1	109	4	....	....	1
49	Fractures of Lower Limb	N820–N829	308	257	11,786	12,488	7·66	38	49	M.	3	283	9	....	....	13
										F.	7	227	7	....	2	14
50	Dislocation without Fracture	N830–N839	46	22	629	171	·25	14	8	M.	....	44	2	....	....	....
										F.	2	19	1	....	....	....
51	Sprains and Strains	N840–N848	44	17	377	175	·17	9	10	M.	....	42	2	....	....	....
										F.	....	17	....	....	....	....
52	Head Injury excluding skull fracture	N850–N856	418	189	2,716	1,515	1·34	6	8	M.	39	347	11	....	2	19
										F.	25	156	3	....	4	1
53	Internal Injury of Chest, Abdomen, Pelvis	N860–N869	49	11	785	140	·29	16	13	M.	12	35	....	....	....	2
										F.	3	8	....	....	....	....
54	Lacerations, Contusions and Superficial Injuries	N870–N929	444	151	4,963	1,023	1·89	11	7	M.	34	399	11	....	....	....
										F.	13	135	3	....	....	....
55	Effects of foreign body entering through orifice	N930–N936	66	82	300	251	·17	4	3	M.	12	49	4	....	1	....
										F.	29	48	5	....	....	....
56	Burns	N940–N949	144	89	2,996	2,102	1·61	21	24	M.	12	125	3	....	1	3
										F.	9	73	4	....	2	1
57	Injury to Nerves and Spinal Cord without bone injury	N950–N959	7	4	49	73	·04	7	18	M.	....	6	1	....	....	....
										F.	1	3	....	....	....	....
58	Effects of Poisons	N960–N979	138	158	698	939	·52	5	6	M.	12	119	3	....	3	1
										F.	11	136	10	....	....	1
59	Effects of exposure and unspecified injuries and reactions	N980–N999	150	86	1,729	1,289	·95	12	15	M.	13	131	3	....	....	3
										F.	7	71	6	....	....	2
	Total (N Categories)	....	2,402	1,312	37,629	24,124	19·49	....	....	....	266	3,229	120	1	16	82
60	Investigations, observations and after care	Y00–Y10	83	55	352	165	·16	4	3	M.	18	52	13	....	....	....
										F.	2	46	7	....	....	....
	Total (Y Categories)	....	83	55	352	165	·16	....	....	....	20	98	20	....	....	....
	Grand Total	....	11,093	10,143	168,585	148,336	100%	....	....	....	2,182	15,837	2,077	12	410	718

* Results :
1 = Cured
2 = Improved
3 = Unchanged
4 = Investigation only
5 = Death with autopsy
6 = Death without autopsy.

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital

OPERATION CASES DISCHARGED IN 1958

Item	Operation	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds *	Average Number Days in Hospital		Results					
			Male	Female	Male	Female		Male	Female	Sex	1	2	3	4	5 and 6
1	Neurosurgery, Brain and Cerebral Meninges	001–019	114	70	2,723	2,281	1·56	23·9	32·6	M.	1	58	35	....	20
										F.	....	43	14	2	11
2	Neurosurgery, Spinal Cord and Spinal Meninges	020–029	69	36	2,913	963	1·22	42·2	26·8	M.	11	43	13	....	2
										F.	....	21	9	....	6
3	Neurosurgery, Peripheral Nerves and Sympathetic System	030–049	31	14	339	82	·13	10·9	5·9	M.	1	16	2	....	2
										F.	1	13	....	....	....
4	Thyroid and Parathyroid	070–079	3	23	41	473	·16	13·7	20·6	M.	1	2	....	....	....
										F.	3	20	....	....	....
5	Adrenals	080–084	....	10	....	572	·18	....	57·2	M.	....	....	....	....	....
										F.	....	3	3	....	4
6	Pituitary, Thymus and Other Endocrine Organs	085–096	....	2	....	58	·02	....	29·0	M.	....	....	....	....	....
										F.	....	2	....	....	....
7	Ophthalmic Operations	100–199	298	303	4,696	4,279	2·83	15·8	14·1	M.	19	273	4	....	2
										F.	27	265	8	....	3
8	Ear, Nose, Throat, Pharynx, Tongue, Palate Buccal Cavity	200–249 and 260–299	683	527	4,531	2,302	2·16	6·6	4·4	M.	103	550	19	....	11
										F.	99	412	12	....	4
9	Teeth and Gums	250–259	82	82	407	374	·25	5·0	4·6	M.	19	60	3	....	....
										F.	12	65	5	....	....
10	Heart and Pericardium and Intrathoracic Great Vessels	300–329	24	32	542	470	·32	22·6	14·7	M.	1	13	7	....	3
										F.	....	7	7	....	1
11	Lung, Bronchus, Mediastinum and Collapse Therapy	330–354	151	88	3,349	2,473	1·84	22·2	28·1	M.	14	85	43	....	9
										F.	3	50	28	1	6
12	Operations on Breast	380–389	4	64	26	1,087	·35	6·5	16·9	M.	1	3	....	....	....
										F.	12	65	6	....	1
13	On Abdominal Wall	400–419	380	244	6,071	4,855	3·45	16·0	20·0	M.	70	267	16	....	27
										F.	46	154	22	....	22
14	On Stomach	420–439	125	40	2,803	791	1·13	22·4	19·8	M.	18	94	7	....	6
										F.	9	24	2	....	5
15	On Appendix	440–449	277	258	2,471	2,154	1·46	8·9	8·3	M.	78	198	1	....	....
										F.	83	174	1	....	....
16	On Intestines except Appendix and Rectum	450–469	78	78	2,251	1,980	1·36	28·9	25·4	M.	12	51	7	....	8
										F.	11	54	7	....	6
17	On Rectum and Anus	470–499	99	70	1,875	1,627	1·11	18·9	23·2	M.	20	71	4	....	4
										F.	13	51	5	....	1
18	On Liver and Bile Ducts	500–529	57	132	1,440	2,602	1·28	25·3	19·7	M.	12	37	3	....	5
										F.	39	83	3	....	7
19	On Pancreas	530–539	....	2	....	40	·01	....	20·0	M.	....	....	....	....	....
										F.	....	1	....	....	1
20	On Spleen	540–549	10	6	243	150	·12	24·3	25·0	M.	4	6	....	....	....
										F.	....	4	....	....	2
21	On Kidney and Ureter	600–639	47	45	1,219	855	·65	25·9	19·0	M.	6	34	2	....	5
										F.	5	32	7	....	1
22	On Bladder and Urethra	640–669	219	79	4,377	1,159	1·75	20·0	14·7	M.	13	149	38	....	19
										F.	5	54	20	....	....

OPERATION CASES DISCHARGED IN 1958—*continued*

Item	Operation	International Classification Categories	Number of Cases		Number of Days in Hospital		Per cent. of Total Oper'n Beds *	Average Number Days in Hospital		Results					
			Male	Female	Male	Female		Male	Female	Sex	1	2	3	4	5 and 6
23	On Prostrate and Seminal Vesicles	670–679	201	....	5,713	....	1·80	28·4	....	M.	23	154	8	....	16
										F.	....	....	....	....	....
24	Other Male Genital Organs	680–699	130	....	950	....	·30	7·3	....	M.	29	98	2	....	1
										F.	....	....	....	....	....
25	On Ovary and Fallopian Tubes	700–719	....	66	....	1,046	·33	....	15·8	M.	....	....	....	....	....
										F.	18	46	2	....	....
26	On Uterus and Supporting Structures (D. & C. = 113)	720–739	....	349	....	3,699	1·17	....	10·6	M.	....	....	....	....	....
										F.	69	248	32	....	....
27	On Vagina, Vulva and Perineum	740–759	....	270	....	2,903	·92	....	10·7	M.	....	....	....	....	....
										F.	99	149	20	....	2
28	Obstetric Operations (D. & C.)	760–799	....	423	....	1,649	·52	....	40·0	M.	....	....	....	....	....
										F.	181	239	3	....	....
29	Orthopaedic Surgery	800–899	799	540	19,099	17,890	11·67	23·9	33·1	M.	25	730	27	1	16
										F.	15	489	16	....	20
30	On Peripheral Blood Vessels and Lymphatic System	900–929	84	107	1,855	1,825	1·16	22·1	17·1	M.	5	54	21	....	4
										F.	11	82	13	....	1
31	On Skin and Subcutaneous Tissue	930–949	533	330	9,656	5,825	4·88	18·1	17·6	M.	49	468	15	....	1
										F.	34	288	8	....	....
32	Other Surgical Procedures	950–999	146	99	2,867	1,346	1·33	19·6	13·6	M.	9	119	13	....	5
										F.	11	74	10	....	4
	Total	....	4,644	4,389	82,457	67,810	47·41	....	....	....	1,350	6,845	553	4	274

* Operation cases occupied 47 per cent. of the total bed days.

Royal Perth Hospital, Fremantle Hospital and Princess Margaret Hospital

ACCIDENTS, POISONING AND VIOLENCE, 1958

Category	No. of Patients	Per cent. of Hospital Beds Occupied	No. Died
Railway accidents	16	·20	....
Motor Vehicle traffic accidents	902	6·06	36
Motor Vehicle non-traffic accidents	59	·33	4
Other Road Vehicle accidents	97	·30	3
Water Transport accidents	11	·07	....
Accidental Poisoning	179	·19	1
Accident Falls	831	5·50	33
Accidents caused by hot substance, corrosive or steam	158	·86	1
Other accidents	1,180	4·51	15
Medical and Surgical complications and Therapeutic misadventures	118	·56	2
Late effects of injury	19	·11	....
Suicide and self-inflicted injury	137	·61	4
Homicide and assault	38	·09	....
Total	3,745	19·39	99

Appendix XXV

INCIDENCE AND MORTALITY OF NOTIFIABLE INFECTIOUS DISEASES

Diseases Notifiable	1956			1957			1958			1959		
	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths	Cases Re-ported	Amend. Diag-nosis	Deaths
Acute Rheumatism	21	21	(A) 3	27	27	(A) 4	21	21	(A)3	15	15	(A) 7
Amoebiasis	7	7	....	4	4	....	1	1	....	1	1	1
Ankylostomiasis	1	1	1	....	....	....	1	1	....	1	1	....
Brucellosis	3	3	....	2	2	....	....	....	....	8	8	....
Chorea	1	1	....	1	1	....	1	1	....	2	2	1
Dengue Fever	....	....	....	....	....	....	....	....	....	1	1	....
Diphtheria	159	145	1	66	63	1	26	24	....	49	48	1
Dysentery (Amoebic)	9	9	1	6	6	....	1	1	....	1	1	1
Dysentery (Bacillary)	71	71	3	46	46	....	121	121	....	188	188	2
Encephalitis, Lethargic	2	2	1	2	2	1	....	....	....	....	....	....
Erythema Nodosum	1	1	....	1	1	....	2	2	....	1	1	....
Hydatid	....	....	1	....	....	1	....	....	....	....	....	1
Infantile Diarrhoea	48	48	(B) 8	23	23	(B) 13	12	12	(B) 22	26	26	(B) 12
Infective Hepatitis	181	181	4	363	363	3	396	396	1	142	142	2
Lead Poisoning	13	13	1	1	1	....	1	1	....	2	2	1
Leprosy	34	34	....	33	33	....	38	38	....	18	18	....
Leptospirosis	....	....	....	....	....	....	....	....	....	2	2	....
Malaria	6	6	....	2	2	....	2	2	....	3	3	....
Meningococcal Infection	13	13	2	6	6	5	9	9	2	3	3	4
Paratyphoid	....	....	....	3	3	1	2	2	....	....	....	....
Poliomyelitis	416	401	15	9	3	1	3	1	....	3	3	....
Pleural Effusion	5	5	1	6	5	1	5	5	....	13	11	1
Puerperal Fever	1	1	....	2	2	....	1	1	....	3	3	....
Purulent Ophthalmia	31	31	....	9	9	....	30	30	....	50	50	....
Rubella	85	85	....	550	550	....	3,059	3,059	....	221	221	....
Salmonella Infection	27	27	....	21	21	1	45	45	....	40	40	....
Scarlet Fever	57	57	....	120	120	....	191	190	....	60	60	....
Tetanus	15	15	10	4	4	3	11	11	4	5	5	2
Tetanus Neonatorium	1	1	....	....	....	....	....	....	....	....	....	....
Trachoma	280	280	....	656	656	....	364	364	....	1,149	1,149	....
P.T.B.	429	419	43	347	327	35	388	350	23	345	309	24
Other T.B.	43	44	3	32	32	1	27	24	4	35	34	....
Typhoid Fever	8	8	....	9	9	....	22	22	2	8	8	1
Typhus Fever	16	16	....	7	7	....	5	5	....	6	6	....

Deaths exclude full-blood aboriginals.

(A) Rheumatic Fever.

(B) Gastro-Enteritis and Colitis (except ulceration) under two years and Diarrhoea of the new born.

Appendix XXVI

MATERNAL MORTALITY

Period	Average Live Births	Average Maternal Deaths	Average Rate
1901–1905	6,681	28·0	4·19
1906–1910	7,691	43·4	5·64
1911–1915	8,844	39·4	4·46
1916–1920	7,726	41·4	5·36
1921–1925	8,056	34·2	4·25
1926–1930	8,748	46·8	5·35
1931–1935	8,062	35·4	4·39
1936–1940	8,877	32·4	3·65
1941–1945	10,408	24·4	2·34
1946–1950	13,130	21·4	1·63
1951–1955	15,724	13·8	0·88

Year	Live Births	Deaths From									
		Puerperal Septicaemia		Other Puerperal Infections		Abortion		All other Complications of Pregnancy and of the Puerperal State		All Complications of Pregnancy and the Puerperal State	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1943	10,481	2	0·19	1	0·10	3	0·29	17	1·62	23	2·19
1944	10,870	2	0·18	2	0·18	5	0·46	18	1·66	27	2·48
1945	10,672	....	....	2	0·19	5	0·47	13	1·22	20	1·87
1946	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	14,228	....	....	2	0·14	1	0·07	12	0·84	13	0·91
1951	14,794	....	....	2	0·14	3	0·20	11	0·74	16	1·08
1952	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	15,862	....	....	....	....	1	0·06	8	0·50	9	0·57
1954	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65
1958	16,731	....	....	....	....	1	0·06	7	0·42	8	0·48
1959	17,111	....	....	....	....	1	0·06	4	0·23	5	0·29

All rates per thousand live births.

	1958
Western Australia	0·48
New Zealand (*a*)	0·41
New South Wales	0·65
Victoria	0·31
Queensland	0·47
Tasmania	0·09
South Australia	0·30

(*a*) Non-Maori.

Appendix XXVII

STILLBIRTH AND INFANT MORTALITY RATES

Year	Total Births including Stillbirths	Stillbirth Rates	Neo-Natal Rates.		Total Mortality Rates under One Year	Other Post Natal Rates Over One Month and Under One Year
			Under One Week	Under One Month		
1926	8,534	27·4	....	27·6	48·0	20·4
1927	8,708	26·0	....	23·0	44·7	21·7
1928	8,981	30·9	....	23·1	35·5	12·4
1929	9,316	28·4	18·8	25·8	54·6	28·8
1930	9,456	27·0	18·0	23·5	46·5	23·0
1931	8,777	26·0	20·1	26·6	40·5	13·9
1932	8,175	25·7	21·02	25·2	43·5	18·3
1933	8,105	29·4	18·1	22·5	35·8	13·3
1934	8,029	29·2	19·3	24·8	38·8	14·0
1935	8,377	30·8	20·6	24·8	39·0	14·2
1936	8,730	28·9	19·6	24·8	41·0	16·2
1937	8,850	27·2	16·8	21·2	36·5	15·3
1938	9,325	23·9	16·6	19·1	33·1	14·0
1939	9,249	23·0	16·5	19·7	40·0	20·3
1940	9,363	25·9	20·5	24·9	43·0	18·1
1941	10,375	24·6	15·1	18·1	34·4	15·7
1942	10,109	20·6	17·1	20·3	36·2	15·9
1943	10,759	25·8	17·1	21·0	31·8	10·8
1944	11,144	24·8	18·6	21·0	32·0	11·0
1945	10,896	20·6	18·0	20·0	28·9	8·9
1946	12,398	23·1	17·1	20·6	30·3	9·6
1947	13,178	23·2	16·9	19·4	30·2	13·2
1948	13,197	20·5	16·9	18·7	25·0	8·4
1949	13,779	19·4	16·2	19·0	25·9	6·8
1950	14,468	16·6	16·2	18·0	26·7	8·6
1951	15,091	19·7	16·2	19·7	28·2	8·5
1952	15,697	18·1	15·5	17·7	24·5	6·8
1953	16,130	16·6	13·4	16·2	23·4	7·3
1954	16,198	16·7	14·2	15·8	22·2	6·4
1955	16,862	14·2	13·3	15·8	22·1	6·3
1956	17,142	13·2	13·0	15·7	22·4	6·7
1957	17,169	14·3	13·6	14·9	20·8	5·9
1958	16,956	13·3	12·8	14·2	21·2	7·1
1959	17,336	13·0	12·3	13·6	19·9	6·3

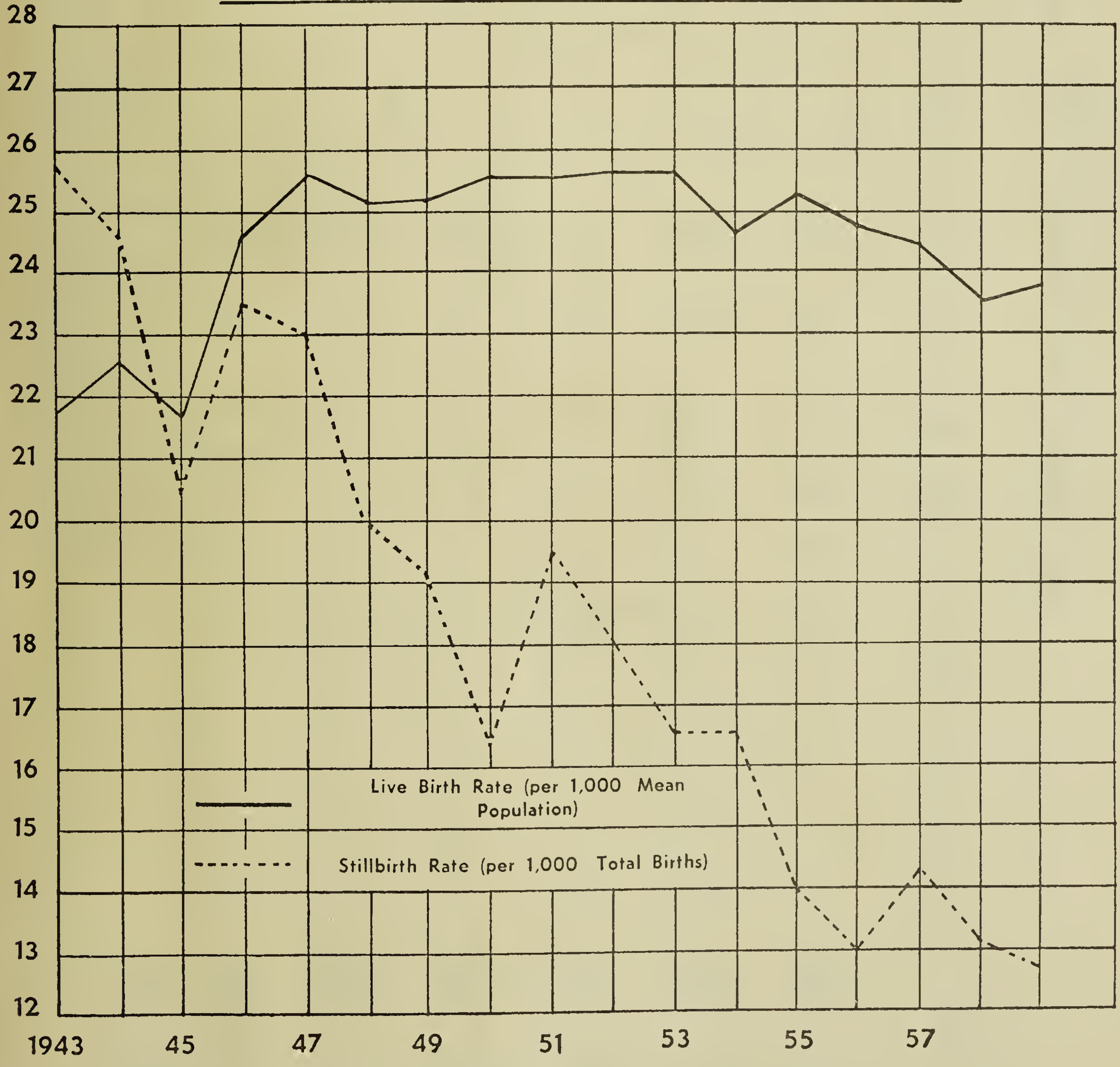
In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

Appendix XXVIII

WESTERN AUSTRALIA – STILLBIRTH AND BIRTH RATES

Year	Mean Population	Live Births		Stillbirths	
		Number	Rate per 1,000 Mean Population	Number	Rate per 1,000 Total Births
1943	476,745	10,481	21·98	278	25·84
1944	481,498	10,870	22·58	274	24·59
1945	487,510	10,672	21·89	224	20·56
1946	492,771	12,105	24·57	293	23·63
1947	502,951	12,874	25·60	304	23·07
1948	514,621	12,931	25·13	266	20·16
1949	532,603	13,511	25·37	268	19·45
1950	557,878	14,228	25·50	240	16·59
1951	580,317	14,794	25·49	297	19·68
1952	600,615	15,413	25·66	284	18·09
1953	621,034	15,862	25·54	268	16·62
1954	640,140	15,928	24·88	270	16·67
1955	658,747	16,623	25·23	239	14·17
1956	677,317	16,916	24·98	226	13·18
1957	691,723	16,924	24·47	245	14·27
1958	705,600	16,731	23·71	225	13·27
1959	718,830	17,111	23·80	225	12·98

WESTERN AUSTRALIA – STILLBIRTH AND LIVE BIRTH RATES



APPENDIX XXIX

MEAT INSPECTION FOR YEAR ENDED 31ST DECEMBER, 1959

Number and Type of Animals Slaughtered		Carcases Condemned for—									Part Carcases Condemned for—						Organs Condemned for—					
		Tuberculosis	Actinomycosis	Piroplasmosis	Caseous Lymphadenitis	Para-Typhoid	Traumatic and Septic Conditions	Pleuro-Pneumonia	Other Abnormalities	Carcases Condemned Totals	Actinomycosis	Caseous Lymphadenitis	Tuberculosis	Arthritis	Other Abnormalities	Part Carcases Condemned Totals	Actinomycosis	Echinococcosis	Pleuro-Pneumonia	Tuberculosis	Other Abnormalities	Organs Condemned Totals
Robb's Jetty (including Watson's)																						
Cattle	25,188	33	....	8	....	....	111	....	119	271	117	....	....	1	32	150	324	71	2	56	996	1,449
Calves	191	....	....	....	....	....	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	227,702	....	....	....	12	....	132	....	478	622	....	391	....	349	38	778	....	130	....	....	13,692	13,822
Pigs	83,224	67	....	....	....	17	21	....	102	207	....	....	1,615	10	967	2,592	....	2	....	2	40,474	40,478
Midland Junction (including Foggitt's)																						
Cattle	57,101	151	....	1	....	....	102	....	195	449	153	....	69	3	115	340	284	237	....	87	1,351	1,959
Calves	5,267	21	....	....	....	....	....	....	8	29	....	....	....	....	....	....	....	....	....	....	1	1
Sheep	855,406	....	....	....	195	....	810	....	3,696	4,701	....	534	....	677	45	1,256	....	....	....	....	56,745	56,745
Pigs	49,757	41	....	....	....	22	6	....	19	88	....	....	58	161	66	285	....	....	....	....	12,581	12,581
Kalgoorlie																						
Cattle	3,388	3	....	....	....	....	....	....	1	4	58	....	12	....	7	77	....	7	....	....	88	95
Calves	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sheep	51,128	....	....	....	1	....	5	....	13	19	....	34	....	14	11	59	....	219	....	....	2,650	2,869
Pigs	2,852	1	....	....	....	....	....	....	2	3	....	....	28	2	12	42	....	....	....	....	132	132
Perth Meat Markets																						
Cattle	1,774	....	....	....	....	....	8	....	7	15	....	....	1	....	35	36	....	....	....	....	64	64
Calves	11,145	....	....	....	....	....	47	....	56	103	....	....	....	....	10	10	....	....	....	....	28	28
Sheep	1,417	....	....	....	....	....	1	....	32	33	....	....	....	....	....	....	....	5	....	....	146	151
Pigs	476	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Fremantle Meat Markets																						
Cattle	630	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....
Calves	1,914	....	....	....	....	....	....	....	2	2	....	....	....	....	2	2	....	....	....	....	....	....
Sheep	598	....	....	....	....	....	....	....	1	1	....	....	....	3	....	3	....	....	....	....	....	....
Pigs	324	1	....	....	....	2	1	....	2	6	....	....	9	....	3	12	....	....	....	....	....	....
**Country Districts*																						
Cattle	29,150	62	....	....	....	....	20	....	27	109	83	....	39	1	76	199	72	154	....	30	607	863
Calves	10,375	3	....	....	....	....	3	....	179	185	....	....	....	....	....	....	....	....	....	....	4	4
Sheep	220,699	....	....	....	19	....	28	....	1,303	1,350	....	146	....	109	101	356	....	652	....	....	5,287	5,939
Pigs	13,006	26	....	....	....	32	11	....	21	90	....	....	62	10	58	130	....	28	....	41	2,033	2,102
Totals—																						
Cattle....	117,231																					
Calves	28,892																					
Sheep....	1,356,950																					
Pigs	149,639																					

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* Includes the following centres :—Albany, Busselton, Collie, Dardanup (including Bunbury), Geraldton, Harvey, Katanning, Manjimup, †Merredin, Mandurah, Northam, Narrogin, Wagin, Waroona.

† Inspection for part year only.

APPENDIX XXX

REVENUE AND EXPENDITURE FOR THE YEAR 1959

REVENUE

	£	s.	d.
Licence Fees	88	5	0
Meat Inspection Fees	22,644	16	7
Fish Inspection Fees	633	14	3
Pathological Laboratory	3,649	10	0
Sanitation Refunds	275	1	5
Inspection of Plans (Septic Tanks)	16,881	10	0
Miscellaneous	4,442	3	6
Nurses and Midwives Registration and Examination Fees	2,645	2	8
T.B. Diagnosis (Generally)	583,990	12	6
T.B. Diagnosis—			
Wooroloo	5,323	1	9
Perth Chest Hospital	10,449	2	6
Health Supervision Charges	87	10	6
Baby Patterns	14	5	0
Hospital Benefits—Lepers	146	8	0
Supplementary and Organisation Benefits—Lepers	225	0	0
Poliomyelitis After-care	582	17	0
Immunised Diphtheria	341	8	9
Infectious Diseases	12,462	1	10
Pesticide Registration	191	6	0
T.B. Laboratory Fees	3,412	13	0
	£668,486	10	3

EXPENDITURE

Salaries (including Tuberculosis)	546,340	10	4
Infectious Diseases	19,922	13	3
School Medical Doctors and Nurses Travelling	3,826	6	6
Dental Bursaries	6,484	12	10
School Dentists Travelling and Expenses	5,540	16	5
School Medical and Dental Services, other expenditure	11,349	7	9
Travelling and Transport Generally	3,699	8	4
Travelling and Transport Commissioner and Medical Officer	1,153	5	3
Ophthalmic Survey	6,069	8	0
Postage and Telephones	1,417	19	8
Laboratory	28,701	3	7
Venereal Diseases	2,759	5	8
Infant Welfare Centres	85,018	16	8
Maintenance and Transport Lepers	22,883	19	4
Poliomyelitis	19,305	8	6
Sanitation, Government Buildings	15,517	8	4
Health Education	* 4,963	1	1
Tuberculosis Clinics	340,101	16	8
Miscellaneous	14,081	18	9
	£1,139,137	6	11

* No expenditure by this Department after 30th June, 1959.

42169/11/60

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